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DISEASES *of the* CHEST

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Pleurisy with Effusion Associated with Pseudomucinous Cystadenoma (Meig's Syndrome)

ERNEST D. NORA, M.D.

RICHARD M. DAVISON, M.D., F.C.C.P.

Chicago, Illinois

The general paucity of information, relative to a syndrome of the hydrothorax with benign ovarian tumors and ascites, has too frequently led to a diagnosis of malignancy with chest metastasis. It is the object of this paper to review the literature, analyze thirty-seven cases, and to present another case which is unusual from the standpoint of tumor pathology. There is only one similar case presented in the literature.

The association of ovarian tumors with ascites has not been an uncommon thing. Boldt¹ in 1910 reported a case of an ovarian fibroid tumor with ascites, and Titus² in 1913, in a discussion of a fibroma of the ovary, stated that ascites was an accompaniment in about half of the cases. In 1914 Fullerton³ commented on the frequent early occurrence of ascites in cases of a fibroid tumor of the ovary. In 1914 Hellman⁴ reviewed the literature and found that ascites was associated with at least five per cent of all of the cases of ovarian fibroma, which is considerably less than Titus and Fullerton would lead us to believe. Reel,⁵ Saint,⁶ Richardson,⁷ Macdonald,⁸ and Owen⁹ all presented similar cases between the years of 1917 and 1923. Although Owen mentioned the fact that hydrothorax might occur with ascites and ovarian tumor, he presented no evidence to substantiate his statement. Hoon¹⁰ in 1923, in review of all of the cases of ovarian fibroma of the Mayo Clinic from 1910 to 1921 mentioned two with a hydrothorax and ascites which disappeared after surgical removal of the tumor. Salmon¹¹ presented two cases in 1934 and stressed the association of a

*From the Service of Dr. Frederick Tice, aided by the Cuneo Research Foundation.

hydrothorax with benign pelvic tumors with ascites and pleural effusions; however, it was not until 1937 that this association was recognized as a syndrome. At this time, Meigs and Cass¹² reported Hoon's two cases, a case of Leo's, and four additional cases from the records of the Massachusetts General Hospital. They emphasized the fact that the hydrothorax and ascites cleared up quickly after surgical removal of the tumor.

This work inspired such an interest in the syndrome that a number of cases, old and new, literally sprang into the literature. The earliest recorded case was that of Cullingworth's¹³ in 1879. Apparently, his patient died from non-treatment. The necropsy revealed a left hydrothorax with a collapsed left lung, congestion and edema of the right lung, marked ascites, bilateral large solid tumors of the ovary, and a thickened pleura and peritoneum. Tait¹⁴ presented a second case in 1890 of a left hydrothorax, marked ascites, and a large round solid tumor. Since malignancy was suspected, an operation was postponed. Thirty paracenteses were done with no relief to the patient. Several thoracenteses had been performed previously with apparent cure of the condition. After the tumor was removed, the patient made a slow recovery, which was interrupted only by the formation of a retrouterine abscess. This abscess cleared up after opening and drainage.

In 1937 Rhoads and Terrel¹⁶ presented a case; Weld,¹⁵ in 1938, presented two cases. In 1940 Bomze and Kirshbaum¹⁷ presented two cases. In the next two years Harris and Meyer,¹⁸ Henderson,¹⁹ Lock and Collins,²⁰ Jones,²¹ Glass and Goldsmith,²² and Ritvo²³ added six cases to the list. In 1943 and 1944 an additional six cases, all of benign ovarian fibroma associated with ascites and hydrothorax, were presented by Herrick, Tyson, and Watson,²⁵ Keleman,²⁶ Clay, Johnston, and Samson,²⁷ Mendel and Tyrone,²⁸ and Gardiner and Lloyd-Hart.²⁹

A case similar to our case was presented by Macfee²⁴ in 1941. Although the tumor was a multilocular cystadenoma, a variation from the usual fibroma, it, with ours, fits into the symptom complex emphasized by Meigs and Cass.

A case was presented by Millett and Shell³⁰ early in 1945 that is almost identical to our case. The patient, 39 years old, complained of dyspnea on mild exertion. The examination, confirmed by fluoroscopy, revealed a right hydrothorax and an enlarged abdomen. She had no gastric distress, no peripheral edema, and no urinary symptoms. Her menses were regular until three months previous to the examination. During that month she menstruated twice. A thoracentesis was done on the day of admittance, twice before surgery, and once on the twelfth postoperative day. Cultures and guinea pig examinations of the fluid were negative. The

laparotomy revealed a moderate amount of fluid, a large ovarian cyst, later found to be a pseudomucinous cystadenoma, and several mucinous implants on the peritoneum. The patient made an uneventful recovery.

CASE HISTORY

A white female, A. F., forty-two years old, was admitted to the hospital on January 4, 1945, complaining of anorexia and pressure in the epigastric region. The patient's family history was negative. She had been married ten years and never able to become pregnant. Menstruation began at the age of eighteen with no irregularity until the early part of 1944, at which time her periods varied from two to ten and twelve days, and sometimes she did not menstruate at all. She also noticed distention of her abdomen.

In August 1944, she was told that she had a pleural effusion. Several thoracenteses were done which partially relieved her dyspnea. Six weeks prior to admission to the hospital, the doctor told her that she had an abdominal tumor and hydrothorax. Four thoracenteses were done.

The only abdominal symptom the patient had was the "pressure feeling." Just before her first aspiration, her left lower extremity became edematous from the foot to the knee. The edema receded completely after the aspiration. She was aspirated at two to three week intervals, and at each of the four aspirations approximately two liters of fluid were removed. Cultures of the fluid were sterile; guinea pig inoculations were negative for tuberculosis, and the fluid had the appearance of a transudate.

A physical examination revealed that the thoracic respiratory expan-

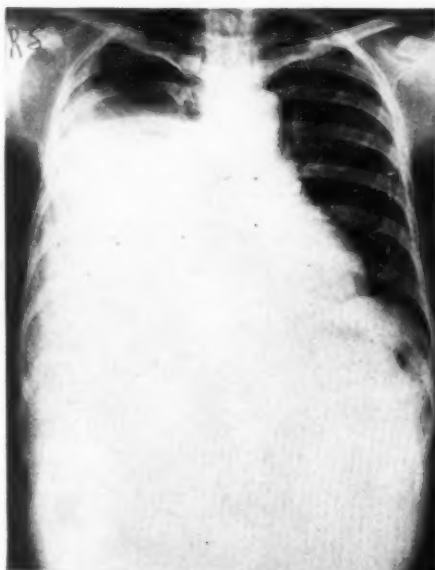


Figure 1

Figure 1: X-ray of the line of pleural effusion on August 13, 1944.



Figure 2

Figure 2: X-ray of the line of pleural effusion on September 12, 1944.

sion was the same bilaterally even though a thoracentesis had been performed just before the examination. Prior to the thoracentesis, the right intercostal spaces were larger. On palpation, an increased vocal phremitus was elicited on the left and upper part of the right side. Percussion revealed a normal pulmonary resonance at the right upper lobe. There was a dullness and even a flatness at the base of the right lung up to the third intercostal space. Auscultation revealed bronchovesicular respiration in the left side. Clinically, there was no evidence of any parenchymal consolidation. No murmurs or extrasystoles were present in the heart, and there was no arrhythmia. There was a collateral venous circulation in the anterior wall of the chest.

Examination of the abdomen revealed an engorgement of the superficial veins. A large tumor mass was palpated. It extended five centimeters above the umbilicus. The surface appeared smooth to the touch, and it was painless to palpation. The mass was situated in the hypogastric region and resembled a uterus almost at full term. The liver and spleen were not palpable. The Blood Count, Urinalysis, and Kahn were negative. The impression was that it was either a malignancy of the internal genitalia with metastasis to the lung or a Meig's Syndrome.

The patient was operated on January 5, 1945, and a large ovarian cyst, weighing 4,200 grams, was removed. The peritoneum was adherent and studded. There was miliary studding on the surface of the liver, and ascites. A tube was inserted in the right chest cavity.

The Pathological Examination revealed a multilocular, grayish red, mucinous cyst. It was filled with a stringy, gray, mucinous fluid which was not precipitated by Acetic Acid. The daughter and granddaughter cysts varied in size from a split pea to a small orange. There were many gray, necrotic areas in the cyst wall of the parent cyst, which extended into the daughter and granddaughter cysts.

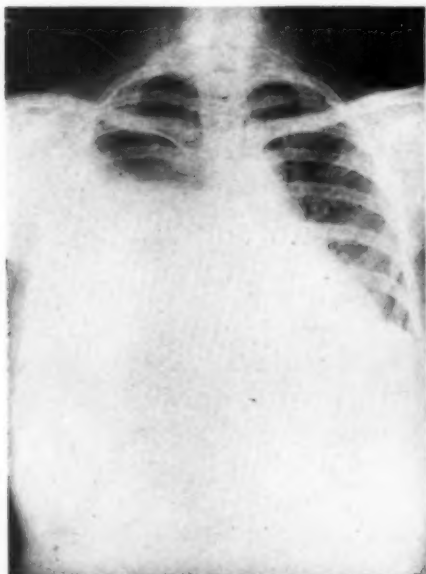


Figure 3



Figure 4

Figure 3: X-ray of the line of pleural effusion on October 30, 1944.

Figure 4: Note clearness of chest on December 10, 1945, one year after surgery.

The Microscopic Examination revealed the typical pallisading of tall columnar cells with large quantities of degenerated, colloidal material having a rather reddish hue. No definite evidence of anaplasia was encountered.

Diagnosis: Pseudomucinous cystadenoma of the ovary.

On the first postoperative day 175 cc. of fluid were aspirated from the chest. By the third postoperative day, no further tendency to fluid development was observed, and the tube was removed; however, the wound did not heal satisfactorily, and some omental tissue was protruding from the wound. On the fourteenth postoperative day, a secondary closure was done after removal of some of the omental tissue. A microscopic examination of the omental tissue revealed an acute peritonitis with some pseudomyxomatous peritoneal implants.

An x-ray of the patient's chest on January 19, 1945, showed a circular area of infiltration at the right base at the level of the dome of the diaphragm with a corresponding fluid level. The patient was discharged from the hospital in a good condition February 2, 1945. X-ray of chest in January, 1946 revealed no fluid.

In analyzing the thirty-eight cases listed, we find that the tumors most frequently occur during the menopause or just before. It is especially significant to chest men that of the thirty-eight cases of ovarian tumor and ascites, seventeen were in the abdomen only. In all of the cases, cultures made of the fluid were sterile, and the fluid was a transudate devoid of malignant cells.

There seems to be no relationship between the amount of hydroperitoneum and hydrothorax. Fifteen cases had marked ascites; thirteen cases had relatively small amounts of fluid. In five of the cases the amount of fluid was relatively large, and the pleural effusion was relatively small. In three cases the amount of fluid was small in both the chest and abdominal cavities.



Figure 5

Microscopic section revealing the lining of the cyst wall which reveals pallisading tall columnar epithelium.

Case No.	Author	Year	Site of Pleural Effusion	No. of Thoracenteses and Amount	Preoperative Paracenteses	Operative Abdominal Effusion	Type of Tumor	Location of Tumor	Chief Complaint
1.	Cullingworth	1879	Bilateral	None	None	Died before surgery	Fibroma	Both ovaries	Metrorrhagia Dyspnea. Ascites.
2.	Tait	1891	Bilateral	Repeated	30	Large amount	Fibroma	Right ovary	Abdominal swelling.
3.	M.G.H.	1901	Right	80 ozs. 62 ozs. 68.5 ozs. 58 ozs. 48 ozs.	2 On 2nd one over 6 pts.	Considerable amount	Fibroma	Not reported	Pain in right chest.
4.	M.G.H.	1902	Right	5 2-4 qts.	None	6-8 qts.	Fibromyoma	Right ovary	Pleurisy.
5.	M.G.H.	1908	Right	8 ozs. 8 ozs. 8 ozs. 8-10 ozs. 2 qts.	18 pts. 14 pts. 15 pts. 18 pts. 260 ozs.	Several quarts	Fibroma	Left Broad Ligament	Pain in shoulder, especially in the left one.
6.	Hoon	1917	Left	1	None	6-8 qts.	Fibroma	Right ovary	Cough. Bloating of abdomen.
7.	Hoon	1920	Right	40 ozs. 60 ozs. 1600 ccs.	6500 ccs.	Several liters	Fibroma	Right ovary	Bloating. Pain between scapula.
8.	Leo	1926	Right	Repeated. 1000 ccs. every few days.	None	Large amount	Benign	Left ovary	Dyspnea. Pain in chest.

9.	de Rouville, et al	1928	Left	1	9	1000 ccs.	Fibroma	Right ovary	Cough. Emaciation.
10.	Bomze and Kirshbaum	1930	Bilateral	None	None	Present	Fibroma	Left ovary	Pain in abdomen with lower ab- dominal mass.
11.	Salmon	1932	Right	1500 ccs. 1500 ccs. 2000 ccs.	None	500 ccs.	Fibroma	Right ovary	Mass in lower ab- domen with irregular cramps.
12.	Salmon	1932	Right	600 ccs. 700 ccs.	None	300 ccs.	Fibromyoma uteri	Uterus	Menorrhagia for two years.
13.	M.G.H.	1934	Right	Repeated	1	Large amount	Fibroma	Left ovary	Dyspnea. Change in bowel habits.
14.	Miller	1936	Not Reported	3	None	Not reported	Fibroma	Right	Pressure. Weak- ness. Disability.
15.	Weld	1936	Right	None	None	3500 ccs.	Fibroma	Bilateral	Swelling of abdomen.
16.	Weld	1936	Right	None	None	Some	Fibroma	Right	Abdominal enlargement.
17.	Macomber	1937	Right	1	1	2 qts.	Fibroma	Left	Abdominal tumor. Dyspnea.
18.	Rhoads and Terrell	1937	Right	Repeated	None	750 ccs.	Fibroma	Right ovary	Dyspnea.
19.	Bomze and Kirshbaum	1937	Left	None	None	Some	Fibroma	Left ovary	Lower abdominal mass Slight dys- pnea. Bearing down sensation. Edematous feet and ankles.

Case No.	Author	Year	Site of Pleural Effusion	No. of Thoracenteses and Amount	Preoperative Paracenteses	Operative Abdominal Effusion	Type of Tumor	Location of Tumor	Chief Complaint
20.	Schenk and Eis	1937	Right	1000 ccs.	None	Not reported	Papillary adeno-carcinoma	Left ovary	Heartburn with dull epigastric pain.
21.	Harris and Meyer	1938	Right	3000 ccs.	None	200 ccs.	Fibroma	Left ovary	Dyspnea. Pain in right chest.
22.	Borg	1939	Bilateral	2	1	Moderate amount of ascites at autopsy	Fibroma	Both ovaries	Abdominal pain. Dyspnea.
23.	Henderson	1939	Right	4	None	Large amount	Fibroma	Both ovaries	Pain in right chest. Breathlessness.
24.	Lock and Collins	1940	Right	None	None	4 liters	Fibroma	Left ovary	Abdominal pain. Distention. Mass.
25.	MacFee	1941	Right	5 times in thirty days	None	Small amount	Cyst-adenoma	Left ovary	Swelling of abdomen. Dyspnea.
26.	Jones	1941	Left	None	None	9 qts.	Fibroma	Left ovary	Loss of weight. Dyspnea. Abdominal tumor.
27.	Glass and Goldsmith	1941	Right	1	None	400 ccs.	Fibroma	Right ovary	Shortness of breath. Abdominal distention.
28.	Melgs	1941	Right	4	1	500 ccs.	Fibroma	Left ovary	Pleurisy. Backache. Asthma. Dyspnea.

29.	Meigs	1941	Right	3	None	500 ccs.	Fibroma	Left ovary	Cough. Dyspnea.
30.	Ritvo	1941	Right	2	None	2 qts.	Fibroma	Right ovary	Lower abdominal pressure. Prolapse.
31.	Keleman	1942	Right	Large amount	None	5500 ccs.	Brenner		Cough. Dyspnea.
32.	Herrick, Tyson and Watson	1942	Right	11 times. 1000 ccs. each time	None	200-300 ccs.	Fibroma	Both ovaries	Increasing dyspnea.
33.	Clay, Johnston and Samson	1944	Right	5 pts.	None	Small amount	Fibroma	Left ovary	Breathlessness with abdominal mass.
34.	Clay, Johnston and Samson	1944	Right	Repeated. Total of 35 pts.	None	400 ccs.	Fibroma	Right ovary	Breathlessness.
35.	Mendel and Tyrone	1944	Right	None	None	4000 ccs.	Thecoma		Abdominal distention. Slight dyspnea.
36.	Gardiner and Lloyd-Hart	1944	Right	Large amount	None	Some	Fibromyoma	Left ovary	Dyspnea.
37.	Millett and Shell	1945	Right	900 ccs. 900 ccs. 1950 ccs. 700 ccs.	None	Moderate amount	Multilocular pseudo-mucinous cystadenoma		Dyspnea.
38.	Davison and Nora	1945	Right	6 times. 2 liters each time.	None		Multi-locular pseudo-mucinous cystadenoma	Right ovary	Anorexia. Upper abdominal pressure. Swollen leg.

Case	Age	Status	No. of Children	End Result	Follow-Up	Pleural Fluid Cultures	Guinea Pig Innoculation	Wassermann
1	36	Married	Yes	Death		Not reported	Not reported	Not reported
2	36	Single	*	Good	Not reported	Not reported	Negative	Not reported
3	42	Single	No	Good	15 months	Sterile	Negative	Not reported
4	55	Married	Yes	Good	11 years	Not reported	Not reported	Not reported
5	38	Married	2	Good	27 years	Sterile	Negative	Not reported
6	36	Married	1	Good	3 years	Not reported	Not reported	Not reported
7	53	Married	No	Good	7 months	Sterile	Negative	Not reported
8	64	*	*	Good	3 months	Sterile	Negative	Not reported
9	58	Married	Yes	Good	Not reported	Sterile	Negative	Not reported
10	37	Married	S.B.	Death		Not reported	Not reported	Not reported
11	52	Married	*	Good	24 months	Sterile	Negative	Negative
12	47	Married	S.B.	Good	17 months	Sterile	Negative	Negative
13	52	Single	No	Good	16 months	Sterile	Negative	Not reported
14	60	Single	No	Good	Not reported	Not reported	Not reported	Not reported
15	55	*	*	Good	3 months	Not reported	Not reported	2 plus
16	50	Married	*	Good	7 months	Not reported	Not reported	Not reported
17	33	Single	No	*	Not reported	Not reported	Not reported	Not reported
18	57	Married	3	Good	7 weeks	Sterile	Negative	Not reported
19	45	Married	*	Good	16 months	Not reported	Not reported	Not reported

20	50	Married	1	Good	7 months	Sterile	Negative	Negative
21	67	Married	2	Good	6 months	Sterile	Negative	Not reported
22	44	Married	Yes	Death		Not reported	Not reported	Not reported
23	42	*	*	Good	Not reported	Not reported	Not reported	Not reported
24	31	Married	1	Good	6 months	Not reported	Not reported	Not reported
25	54	Married	2 abor.	Good	11 months	Sterile	Negative	Not reported
26	50	Married	3	Good	2 months	Not reported	Not reported	4 plus
27	73	*	*	Good	Not reported	Not reported	Not reported	Not reported
28	51	Married	Yes	Good	Not reported	Not reported	Not reported	Not reported
29	66	Married	No	Good	Not reported	Not reported	Not reported	Not reported
30	57	*	*	Good	Not reported	Not reported	Not reported	Not reported
31	49	Married	Yes	Good	11 months	Sterile	Negative	Negative
32	75	Married	5	Good	2 months	Sterile	Negative	Not reported
33	59	Married	No	Good	3 months	Not reported	Not reported	Not reported
34	47	Married	1	Good	10 weeks	Not reported	Not reported	Not reported
35	44	*	*	Good	1 month	Not reported	Not reported	Not reported
36	38	Married	No	Good	Not reported	Not reported	Not reported	Negative
37	39	Married	2	Good	3 months	Sterile	Negative	Not reported
38	42	Married	No	Good	Not reported	Sterile	Negative	Negative

* Not reported. S.B. Stillbirth.

Neither does there seem to be any connection between the location of the tumor and the side of the hydrothorax. All combinations are present, such as: Right ovarian tumor with left hydrothorax, left ovarian tumor with right hydrothorax, bilateral tumors with right, left, and bilateral hydrothorax.

Up to the present time, no cause for the syndrome has been agreed upon. It has been suggested that there may be a lack of right lung drainage by the Azygos vein. Inasmuch as a left hydrothorax has been found, this hypothesis does not seem plausible. At the necropsy of Case No. 22 very large Azygos veins were found.

Selye,³¹ who used data obtained from experimental work on animals, stated that repeated minor trauma to the peritoneum by the tumor causes a resistance of the tissue which later returns to normal; however, after a long period of continued trauma, the resistance disappears, and a histamine toxicosis or anaphylactic shock appears with accumulation of peritoneal and pleural transudates. This reaction can neither be considered proved nor contradicted.

Meigs'³² study of two cases showed that the hydrothorax and ascites were almost identical in protein composition and established some form of communication between the two by showing that particulate carbon, after being injected into the abdomen, almost immediately appeared in the pleural fluid but not in the blood stream.

SUMMARY

1. The second case of Meig's Syndrome due to pseudomucinous cystadenoma of the ovary is presented.
2. The case was presented to make people more conscious of a condition that responds very well to a simple operation or second operation as in this case.
3. The literature is reviewed, brought up-to-date, with the addition of the leg portion of the syndrome.
4. The fact that the fluid in the peritoneal cavity differed from that in the thoracic cavity would mean that the cells found in the peritoneum did not get beyond the diaphragmatic barriers.

RESUMEN

1. Se presenta el segundo caso del Síndrome de Meig causado por un cistoadenoma pseudomucinoso del ovario.
2. Se ha presentado este caso con el objeto de llamar la atención de los médicos hacia un estado que responde satisfactoriamente a una operación sencilla, o a una segunda operación, como este caso.

3. Se revisa la literatura y se la pone al día con la adición de la parte del síndrome referible a la pierna.

4. El hecho de que el líquido en la cavidad peritoneal fue diferente al que se halló en la cavidad torácica parece indicar que las células que se encontraron en el peritoneo no penetraron más allá de la barrera diafragmática.

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Thymectomy in the Treatment of Myasthenia Gravis*

RALPH ADAMS, M.D., F.C.C.P.**

FRANK N. ALLAN, M.D.***

Boston, Massachusetts

Myasthenia gravis was almost always a fatal disease before treatment with prostigmine was introduced.¹ Although this drug and certain other palliative remedies have been most helpful in controlling symptoms and prolonging life, search for curative treatment has continued. In recent years thymectomy has offered hope of surgical arrest or alleviation.

Attention was directed to the thymus because thymoma is known to occur in a substantial percentage of cases of myasthenia gravis. In certain additional cases hyperplasia of the thymus also has been noted. Removal of a thymus tumor or an enlarged thymus or even removal of an apparently normal thymus has been followed by clinical improvement. The results of operation have not been uniform, and for this reason it is desirable to present complete information regarding cases in which surgical treatment has been attempted.

INCIDENCE OF THYMUS PATHOLOGY

In autopsies on patients dying from myasthenia gravis, thymic abnormalities have been found in 47 per cent by Miller² and in 45 per cent by Campbell, Fradkin and Lipetz.³ In a high percentage, the abnormality has been classified as thymoma. In cases reviewed by Gillespie⁴ the incidence of tumor was 50 per cent. Almost all patients with a thymoma eventually develop myasthenia gravis,⁵ but the tumor may be present for some time before myasthenia appears. One of our patients had been known to have a tumor in the upper mediastinum, later proven elsewhere to be a thymus tumor, for more than a year before he presented symptoms. We have removed a thymoma in the case of a 20 year old male who had never had symptoms of myasthenia gravis.

With rare exceptions, tumors of the thymus associated with myasthenia gravis have been benign.³ In one case, reported by Turnbull,⁶ a malignant thymoma was removed; there was no relief from the myasthenia gravis. Meggendorfer, quoted by Miller,²

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**Department of Surgery, The Lahey Clinic, Boston, Massachusetts.

***Department of Internal Medicine, The Lahey Clinic, Boston, Mass.

found one malignant tumor among 60 cases of thymoma in a review made in 1908 of cases then on record with thymoma and myasthenia gravis.

In a total of 32 thymectomies for myasthenia gravis, Clagett⁷ found a thymoma in 15 cases and hyperplasia of the thymus in 17 cases.

Minor changes in the thymus have been found not only in cases with myasthenia gravis but also in cases of primary hyperthyroidism, Addison's disease and acromegaly, according to Sloan.⁸ In his study of 350 thymus glands removed at autopsy and those removed at operation, he did not find changes that were specific for myasthenia gravis.

RESULTS OF SURGICAL TREATMENT

For the reasons stated above, the thymus gland has for a great many years been suspected of at least partial responsibility in the causation of many cases of myasthenia gravis. As early as 1908, Sauerbruch, and later, von Haberer, attempted the removal of a thymic tumor. These early efforts ended in failure. The first report of successful removal of a thymic tumor with a favorable effect upon the course of the associated myasthenia gravis was made by Blalock, Mason, Morgan and Riven⁹ (1939). This tumor was a necrotic mass; no active tumor cells were found, even though there was active myasthenia gravis. Pathologically, it was thought to represent the remains of a necrotic thymic tumor. The patient showed apparent recovery from the myasthenia gravis at the time. Blalock¹⁰ recently reported that death occurred from recurrence after a survival of five and one-half years.

The dramatic improvement in this tumor case led Blalock, Harvey, Ford and Lilienthal¹¹ (1941), to propose and try the effect of thymectomy in 6 cases of myasthenia gravis without demonstrable tumor. The early results as given in this preliminary report were sufficiently encouraging to warrant application in other cases both by the authors and by other surgeons in this country and throughout the world. In the first 20 cases Blalock¹² reported, there were 3 early postoperative deaths, 1 later death, 3 patients essentially well, 5 considerably improved, 5 moderately improved, and 3 unimproved. All 16 surviving patients expressed the opinion that the operation had been helpful. Hardymon and Bradshaw¹³ reported 3 cases of thymectomy with improvement in 1 and no improvement in 2. Viets¹⁴ reported the results in 15 cases from the myasthenia gravis clinic of the Massachusetts General Hospital. Two patients were considered in complete remission, 2 more as distinctly improved, 3 as moderately improved, 1 as slightly improved, and 3 as having been operated upon too

recently to be evaluated. Clagett⁷ reported 17 thymectomies for myasthenia gravis without the presence of tumor in which there was 1 hospital death and 2 later deaths; 2 patients were considerably improved; 6 were moderately improved, and in 6 the operation was thought to have been of little help. He also reported 15 thymectomies for myasthenia gravis with associated tumor in which there was a remission in 3 cases and considerable improvement in 6 cases. Keynes¹⁵ reported upon 51 cases of thymectomy for myasthenia gravis. He did not classify 10 because of mental abnormalities in 1 and operation too recently done in 9. Of the 41 that could be classified, there was a postoperative death in 8; 9 patients were considered as well; 11 as greatly improved; 8 as somewhat improved, and 5 were no better. Our own 8 cases we have classified as follows: considerably improved 2; moderately improved, 4; slightly improved, 1; and dead, 1. In a total of 129 cases reported by Blalock,¹² Bradshaw,¹³ Clagett,⁷ Keynes,¹⁵ Viets¹⁴ and ourselves, the results are: essentially well, 17; considerably improved, 24; moderately improved, 27; and slightly improved, 2. The others are unimproved, unclassified or dead. It would thus appear that 68 of these 129 cases, or 52 per cent, may be regarded as significantly better after the operation.

INDICATIONS FOR THYMECTOMY

It should not be necessary to point out the need for accurate diagnosis of myasthenia gravis before any consideration of surgical treatment. As a rule, the diagnosis can be made easily but in the past, cases for which the surgical treatment might now be advised have been overlooked. The disability has been wrongly attributed to some serious neurologic disorder considered incurable, without even trial of medicinal therapy. This error should not be made by anyone who is familiar with the nature of the muscular weakness in myasthenia gravis. There are three features which serve to identify it.¹⁶ It is selective, it is visible and it is variable. It almost always begins in the muscles controlling the movements of the eyeballs and the muscles concerned with speech, swallowing and mastication; general muscular weakness later develops as the disorder progresses. The change in muscular function can readily be seen in ptosis of the eye lids, strabismus or obvious weakness in the muscles of the face, mouth and tongue. It tends to appear with repeated effort and to decrease or disappear with rest. When the condition is suspected, the diagnosis can be confirmed by observation of the effect of injection of prostigmine.¹⁷ There is almost immediate relief, lasting for two hours or more. A further test consists in the intra-arterial injection of prostigmine, which produces muscular fibrillation in the normal indi-

vidual but simply increases strength in the myasthenic patient.

In the mildest cases it may be difficult to recognize the disorder if the patient is seen at a time when he is rested and thus free from obvious weakness. In such cases, the curare test has been recommended.¹⁸ The administration of a test dose of curare will cause the weakness to appear; it is then abolished by administration of prostigmine. Such a test does not have any bearing on the group of cases of interest to the surgeon, since operation would not be warranted in cases of such mild degree.

After the diagnosis of myasthenia gravis has been established, medicinal treatment should always be carried on for a trial period of at least six months. The medication used consists of ephedrine, 25 mg., twice daily, and prostigmine, administered in 15 mg. tablets, numbering 2 to 24 a day as needed to secure results. Some patients find that the use of potassium chloride gives added relief, but the majority do not feel that the benefit is great enough or certain enough to continue treatment with the large doses required to insure appreciable action. The 12 to 18 tablets of potassium chloride added to the 2 capsules of ephedrine and one or two dozen prostigmine tablets will seem beyond their capacity. Guanidine is a fourth remedy which has proved helpful in certain cases, but because of the relatively slight and uncertain benefit, and the frequency of toxic effects, we have seldom continued to use it for a prolonged period.

The course of myasthenia gravis varies greatly in different cases. Some patients are completely relieved of symptoms and are able to carry on their work and normal activity with medication. In a few cases spontaneous remission has occurred in the course of time, permitting omission of treatment. Other patients, while relieved in part, have continued trouble with the typical symptoms for at least part of each day. These are the cases in which the possibility of further help from surgery is sought. Continued disability after six months' trial of reasonably intensive medicinal treatment is the essential situation in which surgical treatment should be considered.

SELECTION OF CASES

Thymectomy is a surgical procedure of considerable magnitude and the very nature of the illness makes operation of any kind on patients with myasthenia gravis unusually hazardous. In the critically ill patients with respiratory failure impending, operation could not be done without almost certain fatal outcome. In such cases, operation should not be attempted; one should defer radical treatment in the hope that intensive medicinal treatment will bring the patient through the crisis and permit the operation to

be undertaken at a later time under more favorable circumstances.

The cases with myasthenia gravis of mild degree should be excluded from the surgical group also. These are the cases in which rehabilitation by simple medication is effective and to undertake operation with its hazards would not be warranted.

The age of the patient is an important factor. The risk of operation must be considered greatly increased after middle age. It is probably undesirable to operate on any patient older than 35 or 40. Empirically, in estimating the operative risk, a myasthenic patient should be considered as approximately twice the actual age in years.

REPORT OF CASES

The cases are reported in the order in which operation was performed. A preliminary report on the first 3 cases has previously been published.¹⁹

Case 1: A woman, aged 24 years, entered the Clinic on April 4, 1941, with a history of increasing difficulty in talking and swallowing of one year's duration. A test dose of prostigmine relieved the symptoms and a diagnosis of myasthenia gravis was established. She was treated with prostigmine bromide and ephedrine sulfate, with limited benefit. In time she became progressively worse and after five months the prostigmine needed had increased to 180 mg., supplemented by 50 mg. of ephedrine daily. Even on this dosage, she had difficulty in eating. She was weak and was unable to do any work.

The patient was admitted to the hospital on November 23, and kept under observation for five days. During this period, numerous laboratory tests were done which yielded no data of additional significance, as was true also of the other cases in this series. Roentgenologic examination of the chest had revealed no enlargement of the mediastinal shadow to indicate thymic tumor. Neither has there been roentgenologic evidence of thymic enlargement in any of the other cases. Prostigmine was injected into the right brachial artery as a diagnostic test and the strength of the right hand was much improved. Four hours after a dose of prostigmine, its effect having worn off, fluoroscopy with barium in the pharynx showed her unable to swallow and some of the barium suspension entered the trachea.

Thymectomy was performed on November 28, 1941, through an anterior mediastinotomy incision under intratracheal anesthesia. The operative procedure described for this case is the same as that used in the other cases. An incision was made longitudinally from the isthmus of the thyroid downward over the mid sternum and then laterally to the sternal margin. The suprasternal notch was entered and a forefinger passed beneath the sternum. The sternum was split longitudinally in the midline from the suprasternal notch down to the third intercostal space by use of the Lebsche sternum knife and then carried laterally to the sternal margin. A self-retaining retractor was placed to hold the two margins of the split sternum apart. By dissection, the mediastinal pleura of each hemithorax was displaced laterally, thus exposing the intrathoracic portion of the thymus gland. The gland was also exposed

in the neck up to the inferior thyroid artery. In this case it measured 8 by 1 by 0.5 cm. and two lobes were clearly recognizable. Each lobe was removed separately by dissecting it away from the innominate vein, the pericardium and pulmonary artery upon which it lay posteriorly, and the pleura with which it was immediately in contact laterally. The scattered small vessels entering the thymus gland from the mediastinum were divided separately and ligated with fine silk. The neck and anterior mediastinum were searched for any aberrant thymic tissue, but none was found. The wound was closed without drainage. Pathologically, the thymus gland showed no abnormality.

After the operation, prostigmine bromide was given as necessary, about 180 mg. being used the first day, 120 mg. the second day and 90 mg. the third day. Thereafter, the need for prostigmine almost disappeared; after the fourth day she was given only 15 to 30 mg. daily. There was no question about her improvement in swallowing and speech, absence of ptosis and recovery of general strength in spite of reduction of the prostigmine intake. She was discharged on December 16, eighteen days after operation.

This patient has now been followed for four and a half years. The improvement continued for six months, with sporadic need for prostigmine, never amounting to more than 15 mg. in one day. For the following year with no treatment she was, so far as could be determined, in perfect health. She was able to work and enjoy life normally from July 8, 1942, until October 1, 1943. Then the tendency to have trouble with thick speech and drooping of the eyelids slowly returned, necessitating resumption of treatment. From October 1, 1943, to January 1, 1944, she required from 15 to 45 mg. of prostigmine and 25 mg. of ephedrine sulfate, but was able to continue her work. In early 1945 she required no treatment for six months. Later on it was necessary for her to take between 15 and 45 mg. of prostigmine for periods of a few days. In September 1945 she had a partial relapse which began about the time that she was married. Since then she has required from 15 to 60 mg. of prostigmine daily and 25 mg. of ephedrine sulfate. On this medication her symptoms have been entirely controlled and she has been able to do her own housework.

During periods of aggravation of symptoms, both before and since the operation, this patient has complained of a queer sensation of dizziness premenstrually. There has sometimes seemed to be an increase in her myasthenic symptoms premenstrually. We have classified this patient as considerably improved.

Case 2: A girl of 14 years was first seen at the Clinic on January 27, 1942. She developed symptoms of myasthenia gravis shortly after the onset of menses at the age of 12. In the ten months preceding admission, the symptoms had become much worse. The voice tired easily, faded quickly and was nasal in character. She was unable to chew food for more than a brief period because of fatigue in the jaw muscles. While drinking she had to hold the lower jaw up with her hand to keep fluid from spilling out. She complained of thick, ropy mucus being present in the throat. She had diplopia as well as ptosis of the eyelids. The extremities became fatigued very easily. She had lost weight from 118 to 105 lbs. in the four months preceding her examination. A test dose of prostigmine relieved her symptoms.

Although myasthenia gravis is not common with onset at this early

age, the diagnosis was well founded. By trial it was found that 90 mg. of prostigmine bromide and 50 mg. of ephedrine sulfate a day were required to keep her reasonably free from symptoms. Roentgenograms of the chest showed no enlargement of the mediastinal shadows.

An anterior mediastinotomy and thymectomy were performed on March 16, 1942. Two lobes of thymic tissue weighing 18.2 gm. and measuring 13 by 6 by 1.2 cm. were removed. The pathologic diagnosis was hyperplastic thymus. The wound was closed without drainage and she left the operating room in good condition. For the first twenty-four hours after operation her course was entirely uneventful and she showed almost no evidence of having had the procedure. She was given 90 mg. of prostigmine bromide and 50 mg. of ephedrine on the basis of her preoperative requirements. Twenty-four hours after operation acute myasthenia, with frothy mucus filling the throat and trachea, suddenly developed. Tracheal aspiration and intravenous prostigmine restored the equilibrium within a half hour, but thereafter constantly increasing doses of prostigmine were required. Forty-eight hours after operation roentgenograms revealed widening of the mediastinum and patchy areas of density throughout the left upper lung field. Mediastinal aspiration yielded 150 cc. of serosanguineous fluid and she was temporarily improved. Seventy-two hours after operation there was almost no effect from the prostigmine bromide and ephedrine sulfate, even intravenously, in doses as high as 1 cc. of 1 to 200 solution hourly. Epinephrine was noticeably effective but the beneficial response lasted only a few minutes after each of the several times that it was administered. There were terminal signs of cardiac tamponade and she died eighty hours postoperatively.

The striking sign at necropsy was dryness approaching dehydration of the body tissues except for the region of the thorax. The muscles of the chest wall, neck and diaphragm appeared edematous. There was bilateral pleural and pericardial effusion and hemorrhage into the superior mediastinum. It is probable that the mediastinal effusion was instrumental in causing the edema and postoperative relapse of this patient. It was then decided that the wound would be drained postoperatively in subsequent cases. Also, in reviewing the case, it seemed that a respirator if used from the beginning of her untoward reactions might possibly have been helpful. With the aid of a respirator a patient who is refractory to prostigmine might be kept alive until the crisis of failure of respiratory muscles has passed. Consequently, a respirator has been kept at hand for use if needed in all subsequent cases.

Case 3: A girl of 20, first seen at the Clinic on October 29, 1940, because of menstrual irregularity, developed diplopia in August 1942 while under observation and treatment for functional oligomenorrhea. Other symptoms of myasthenia gravis appeared and the condition progressed rapidly. The treatment finally included 360 mg. of prostigmine bromide, 25 mg. of ephedrine sulfate and 1.2 mg. of potassium chloride daily as maintenance dosage. Even with this amount of therapy she was unable to do any work. She frequently required assistance in dressing and in the early morning usually had to use both hands to hold a drinking glass.

Anterior mediastinotomy and thymectomy were done on May 27, 1943. Two thymic lobes which seemed hyperplastic were removed. The thymus tissue removed measured 6 by 6 by 1 cm. and the pathologic diagnosis was hyperplasia of the thymus. The mediastinum was drained by a

cigaret wick wrapped around an urethral catheter. The catheter was drawn out of the wound just above the suprasternal notch while the gauze of the wick was left entirely beneath the skin, but a silk thread anchored to the gauze was brought out alongside the catheter. The skin was closed snugly about the silk thread and catheter and the catheter was placed on 15 cm. suction measured in water.

The postoperative course was not remarkable for the first week. The need for prostigmine dropped to 30 mg. daily by the third day. The mediastinal catheter and wick were removed on the sixth day. The dosage of prostigmine remained at 15 to 30 mg. until the fifteenth day, when she contracted a mild upper respiratory infection, and the prostigmine requirement promptly increased to 90 mg. a day. In the next month she had to be given 210 mg. of prostigmine, 50 mg. of ephedrine sulfate and 1.2 gm. of potassium sulfate. Thereafter there was a slow, gradual decline in the requirement. In October 1943, on 90 mg. of prostigmine a day, she was able to play four sets of tennis or nine holes of golf with enjoyment; she was working full time. It is now three years since her operation. There has been a steady and gradual decrease in her need for medication. She takes from 15 to 30 mg. of prostigmine daily and rarely has any evidence of myasthenia gravis.

Although this is certainly less than a perfect result so far as cure of myasthenia gravis by thymectomy is concerned, the overall improvement which began promptly with her thymectomy has continued gradually to date, and has been impressive and gratifying. Other clinicians have observed this type of gradual improvement beginning a few months after thymectomy. We as well as others have gained the impression that it is the patients with myasthenia gravis of shorter duration who are more likely to show sustained improvement following the operation. We have classified this patient as considerably improved.

Case 4: A 49 year old woman was first seen at the Clinic on December 13, 1944. She suffered from severe primary hyperthyroidism and mild myasthenia gravis. The symptoms of both diseases began concurrently in April 1944, eight months prior to admission. The basal metabolic rate was +63, with pulse of 120. A test dose of prostigmine relieved her diplopia and ptosis. Sixty milligrams of prostigmine were required daily to control her myasthenia gravis, the principal symptoms of which were ptosis of the eyelids and diplopia. The general weakness could be attributed in part to the hyperthyroidism.

The patient was prepared for thyroidectomy with thiouracil and her metabolic rate reduced to +12. Her weakness partially disappeared as the thyrotoxicity was controlled. The thiouracil was administered for sixty-two days and iodine for twenty days prior to hospitalization for operation. The prostigmine requirement was not affected by these drugs given for the thyroid disorder.

A subtotal thyroidectomy was done on March 6, 1945. Through the same low cervical, collar-type incision, as much of the thymus as could be reached through the neck incision, was removed from beneath the manubrium. Probably approximately the upper half of the thymus was removed. Both lobes were normal in appearance and showed no evidence of pathologic change.

Since operation she has had the usual relief from thyrotoxic symptoms. She still has evidence of myasthenia manifested by slight drooping

of one eyelid, which is more noticeable when she is attending church or visiting friends. Slight weakness of the voice develops when she talks a lot. She no longer has diplopia or general muscular weakness. She takes 15 mg. of prostigmine occasionally just before going to church or to some social function, but never more than 15 mg. a day.

Certainly, this was an inadequate thymectomy, but the patient's age, the mildness of the myasthenia gravis, the principal disease of primary hyperthyroidism and her general condition all made thymectomy through a mediastinotomy incision seem inadvisable. There are a number of reports^{20,21,22,23} concerning the concurrence of these two diseases, with contrasting opinions as to whether myasthenia gravis is benefited or made worse by hyperthyroidism. It is our opinion that the benefit in this patient in respect to the myasthenia gravis is more probably related to relief of her hyperthyroidism than to the thymectomy as at least half of the thymus gland is known to remain in situ. We have classified this patient as moderately improved.

Case 5: A woman of 29 years was first seen at the Clinic on February 29, 1940, with complaints of five years' duration which were typical of myasthenia gravis. She was treated medically for the succeeding five years with gradually increasing doses of prostigmine bromide, later supplemented by ephedrine sulfate. On a dosage of 120 mg. of prostigmine and 25 mg. of ephedrine sulfate she was getting along fairly well but was handicapped because of weakness in her hands which made it impossible for her to operate office machines. She had much difficulty with her speech and wanted to attain a better career than her disease would allow.

She requested thymectomy, which was performed through an anterior mediastinotomy incision on May 17, 1945. The thymus measured 12.5 by 1 by 0.5 cm. The pathologic diagnosis was thymic hyperplasia. She had an uneventful convalescence for forty-eight hours and then fairly abruptly developed dyspnea. A chest tap was done and 150 cc. of serous fluid removed from the right upper pleural cavity. The dyspnea temporarily improved but soon recurred, accompanied by coughing with frothy sputum. She developed tension pneumothorax on the right side which was probably the result of an unrecognized injury to the lung by the aspirating needle at the time of the thoracocentesis. The pneumothorax was treated by constant suction and the lung thus kept expanded. On the fourth postoperative day her prostigmine need rose to 180 mg. a day and it was difficult to keep her oxygenated even in a tent. At the end of 108 hours she became markedly worse, with such weakness of the muscles of respiration that respiratory exchange was inadequate. Oxygen from a tent was supplemented with nasal oxygen and she was placed in a respirator. From this critical low point in her postoperative course there was gradual and steady improvement, and on the seventh postoperative day all prostigmine and ephedrine sulfate could be omitted. She was removed from the respirator and oxygen therapy was discontinued on the sixth postoperative day. She took no further prostigmine and felt no need for it. This was in sharp contrast to her preoperative course when she felt urgent need for prostigmine at frequent intervals, and unless she received it, had difficulty in talking and swallowing. She was discharged on June 3, 1945.

The patient returned to work August 23, and when seen on September

5, had taken no prostigmine since leaving the hospital. She was working full time; she frequently went dancing in the evening and stated that she enjoyed the more vigorous types of dancing. Even fast walking had been impossible for her preoperatively. We noticed on examination, however, that her speech was thick and guttural after she had been kept talking for several minutes steadily. The eyelids did not droop but, on the other hand, did not close well. It was suspected that she still had myasthenia gravis, although then in a latent form. This suspicion was confirmed on December 5, when she had a mild partial relapse. Since that time she has required prostigmine in variable doses from 60 to 105 mg. If she takes more she has abdominal cramps. Preoperatively she never had abdominal cramps even when she had taken over 400 mg. in twenty-four hours on a few occasions. On this amount of medication she is working full time and feels well, with full control of symptoms.

This case illustrates vividly the severity of illness and danger to life which any complications postoperatively present in myasthenia gravis. The thymectomy itself is neither very difficult nor particularly dangerous, but there is high risk that a complication which would be mild in a normal individual might endanger life in a patient with myasthenia gravis. We have classified this patient as moderately improved.

Case 6: A girl of 21 was first seen at the Clinic on January 17, 1945, with a history of progressive weakness and fatigability of nine years' duration. She had been treated for myasthenia gravis with prostigmine, but with a dosage of 105 mg. given daily she was unable to do any work and could scarcely hold her eyes open. The diagnosis of myasthenia gravis was readily confirmed and the dosage of prostigmine was increased. Nine months later she was taking 225 mg. of prostigmine supplemented with 50 mg. of ephedrine sulfate daily but still had inadequate symptomatic relief.

Thymectomy was advised and performed through an anterior mediastinotomy incision on October 23, 1945. The thymus was not abnormal grossly or microscopically. It measured 8 by 2 by 1.5 cm. The prostigmine need dropped precipitously from 225 mg. to 30 mg. daily on the fourth postoperative day and disappeared on the eighth day. She was discharged November 4, the twelfth postoperative day.

After an additional week without any prostigmine, she was obliged to resume treatment on November 11. When seen on December 11, 1945, she was taking 45 mg. of prostigmine daily. She felt stronger than preoperatively, even with 225 mg. She showed weakness of the facial muscles and increase of the dosage to 75 mg. daily was advised. She was last seen May 21, 1946, and obviously still had myasthenia gravis. On 75 mg. of prostigmine she had noticeably better facial expression and could smile more easily than preoperatively. Also she had resumed singing in her church choir which she had been forced to give up before operation. There was definite weakness of the leg muscles after climbing a flight of stairs. She has always had the most trouble with myasthenia gravis for the week before and the first three days of her menstrual period. She has then improved to the point of feeling best between the twelfth and seventeenth days after onset. In contrast to the preoperative status her voice was clear, there was no salivation and the eyes did not droop.

We are pessimistic about the prospects of remission in this case with the amount of myasthenia gravis in evidence seven months after operation. Also, the disease has been present for nine years. There have been no irreversible changes demonstrated in this disease but we have gained the impression that patients with a long history prior to operation are less likely to obtain sustained and marked benefit from thymectomy. We suspect that much of her apparent subjective improvement may be explained on a psychologic basis. This latter factor unquestionably is of importance in the responses of these patients. We have classified this patient as only slightly improved.

Case 7: A woman of 31 years was first seen at the Clinic on June 13, 1944, with a history of myasthenia gravis of four years' duration. She had received no previous treatment. The symptoms had begun as slight impairment of speech and blurring of vision and had been only slowly progressive. After establishment of the diagnosis she was started on the usual medication. It was found that 90 to 150 mg. of prostigmine and 50 mg. of ephedrine sulfate daily were required. The patient and her husband desired that operation be done in the hope of obtaining relief from the disease.

Thymectomy was performed through an anterior mediastinotomy incision on January 11, 1946. Although there was no roentgenologic evidence of abnormality in the mediastinal shadow, both lobes of the thymus gland appeared enlarged and edematous. The gland measured 9 by 3 by 0.6 cm. There was no pathologic abnormality discovered. The postoperative convalescence was uneventful, but her prostigmine requirement did not drop on the fourth or fifth day as had been noticed in two of the previous cases. There was a gradual reduction from 120 mg. preoperatively to 60 mg. at the end of the postoperative period. She was discharged on January 30, the nineteenth postoperative day.

This patient wrote us on April 28, 1946. She was doing her own housework and leading a socially active life. She believes herself to be greatly improved, but she still requires 45 to 60 mg. of prostigmine daily. We have classified this patient as moderately improved.

Case 8: A woman of 32 years was first seen at the Clinic on November 8, 1943, with a history of drooping of the eyelids of eleven months' duration. There had been no previous treatment. The prostigmine test was positive. A test dose of prostigmine relieved her symptoms. By trial she was found to need 45 mg. of prostigmine and 25 mg. of ephedrine sulfate daily. In the next two years there was a gradual deterioration in her condition. The prostigmine had to be increased to 135 mg. and ephedrine sulfate to 50 mg. daily, but even so she continued to have marked weakness in her hands and knees, as well as salivation, gagging, diplopia and ptosis. She felt that she would like to have thymectomy performed even though she understood the risk involved and that the effectiveness of the operation could not be predicted.

Thymectomy was performed through an anterior mediastinotomy incision on March 26, 1946. The gland measured 6 by 1.5 by 0.5 cm. and showed no pathologic abnormality. Postoperatively her prostigmine requirement dropped gradually but steadily and she was taking 30 mg. daily at the time of her discharge on April 13, the sixteenth postoperative day. She was last seen on May 10, 1946. She was taking 45 mg. of prostigmine daily without ephedrine. Her eyes drooped if she got very tired.

She felt that she is at least 50 per cent improved over her preoperative status. This estimate is approximately in accord with the reduction in prostigmine need, of which she was requiring 135 mg. preoperatively. It is too early to predict whether the apparent improvement will be sustained. We have classified this patient as moderately improved.

DISCUSSION

As may be seen from a reading of these case reports, the 7 patients living of the 8 operated upon have all experienced subjective and functional improvement. As a result of the operation, the progressive course of myasthenia gravis in 2 of the cases was dramatically reversed. The change may be attributed to the removal of the thymus. It could possibly be due to the anesthesia or to coincidental spontaneous remission. But it is important, also, to realize that they all still have myasthenia gravis. The estimate of the degree of improvement made by the patient in some cases exceeds that made by the physician, but from a practical standpoint the fact of improvement can be granted without argument. On this basis the operation has been, to a greater or lesser extent, successful (excluding, of course, the one fatal case). On the other hand, from the standpoint of complete and permanent cure of myasthenia gravis, it is apparent that thymectomy has failed in all cases. If one postulates that the mere presence of the thymus is responsible for myasthenia gravis in sensitized individuals and attributes improvement when such occurs after thymectomy to removal of the thymus, consistency in logic would imply that some thymic tissue remains in individuals who have shown persistent symptoms of myasthenia gravis after the operation. In each case, the thymus was entirely removed unless some part of it escaped our careful search of the mediastinum and neck or is represented by ectopic tissue elsewhere in the body. If the thymus is not responsible for the disease, at least in part, then one is at a loss to explain the improvement or remission that has occurred in a number of cases after its removal because rapid spontaneous remission has not followed with any such constancy after anesthesia or operations on patients with myasthenia gravis for other conditions.

The results of these 8 cases, in summary, have been classified as considerably improved, 2; moderately improved, 4; only slightly improved, 1; and dead three days postoperatively, 1.

SUMMARY

Thymectomy has been undertaken in an effort to alter the unfavorable course of myasthenia gravis in selected cases.

The incidence of thymic abnormalities found in autopsies of patients dying of myasthenia gravis is approximately 50 per cent.

Aside from tumor, similar thymic abnormalities are found in other debilitating diseases. The incidence of myasthenia gravis in patients with benign thymoma is almost 100 per cent. Myasthenia gravis is very rare in association with malignant thymoma.

In our 8 cases there were 2 considerably improved, 4 moderately improved, 1 only slightly improved, and 1 death three days post-operatively. The results in 129 cases reported by six authors including our own cases, are 68 (52 per cent) classified as well, considerably or moderately improved after operation.

In view of the variation in the behavior of the disease and the lack of uniformity of results of thymectomy, operation is indicated only under the special circumstances which have been discussed.

CONCLUSION

Thymectomy is believed to be indicated for certain patients with myasthenia gravis whose disease is severe and continues to be disabling when adequate medical therapy has been carried on for at least six months, provided the status of disease and general condition allow the procedure to be undertaken with a reasonable expectation of successful technical performance.

RESUMEN

Se ha practicado la timectomía con la intención de alterar el curso desfavorable de la miastenia grave, en casos seleccionados.

La frecuencia de anomalías tímicas encontradas en las autopsias de pacientes muertos de miastenia grave es aproximadamente del 50 por ciento. Con la excepción de tumor, se encuentran anomalías tímicas semejantes en otras enfermedades debilitantes. La frecuencia de miastenia grave en pacientes con timoma benigno es casi del 100 por ciento. Es muy rara la miastenia grave asociada con el timoma maligno.

En nuestros 8 casos hubo 2 considerablemente mejorados, 4 moderadamente mejorados, 1 sólo ligeramente mejorado, y una muerte tres días después de la operación. Los resultados en 129 casos comunicados por seis autores, incluyendo nuestros propios casos, son: 68 (52 por ciento) clasificados como curados, considerablemente mejorados o moderadamente mejorados, después de la operación.

En vista de la variación en el curso de la enfermedad y de la falta de uniformidad de los resultados de la timectomía, se indica la operación solamente en las circunstancias especiales que han sido discutidas.

CONCLUSION

Se opina que está indicada la timectomía en ciertos pacientes con miastenia grave cuya enfermedad es severa y sigue produ-

ciendo incapacidad aún cuando se ha continuado la terapia médica adecuada por seis meses por lo menos, con tal de que el estado de la enfermedad y la condición general del paciente permitan que se practique el procedimiento con una expectativa razonable del buen éxito técnico.

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Discussion

F. P. O'HARA, M.D., F.C.C.P.
San Diego, California

I feel privileged to be asked to discuss this excellently prepared and presented paper, since my experience with this procedure has been limited to two cases. The first having a tumor of the thymus, died shortly following operation, and the second, having no pathological changes present in the gland, shows considerable improvement, with reduction in the amount of prostigmine necessary to relieve her symptoms.

As pointed out by Dr. Adams, the role the thymus plays in the production of the symptoms found in myasthenia gravis is still clouded and indefinite. Some five or six years ago, Dr. Blalock's pioneering work in elective thymectomy for those suffering from myasthenia gravis, with encouraging improvement, if not actual cure, led a number of other men to enlarge on this procedure. It is still too early for too much optimism, but the results both in this country and in Europe show marked and generally consistent improvement of symptoms in the majority of cases.

Among the most plausible of the theories as to the causation of the more or less complete muscular paralysis found in myasthenia gravis is that of the production in the body of some chemical or endocrine substance, perhaps by the thymus, affecting the myo-neural junction by a blockage similar to that produced by the drug curare. The fact that the removal of thymic tumors, cystic or diseased thymic glands, or even more or less normal persistent thymic glands in adults causes a reversal of these symptoms may be misleading. Perhaps this surgical invasion of a field, considered heretofore purely medical in aspect, may be but a stop-gap procedure of therapy, but it has stimulated increased interest and opened up numerous new angles of approach as to the causation of this disease.

It is interesting to note in all reports that, both prior and after thymectomy, in those female patients with myosthenia gravis, the symptoms were worse at the menstrual periods or in early pregnancy, but that there was a remission of these symptoms in later stages of pregnancy. I should like to ask Dr. Adams if any recent experimental work has been done in an effort to extract a substance from the surgically removed specimens that has any influence on those suffering from myasthenia gravis, or on normal subjects?

The surgical approach for complete thymectomy as described need not be enlarged upon. To anyone who has attempted the

complete extirpation of the thymic tissue, the mid-line incision with sternal fissure in the only approach that offers complete and easy dissection under direct vision. The antero-lateral and postero-lateral, either extra-pleural or trans-pleural, leave much to be desired in exposure.

Dr Adams and his associates are to be complimented on their scientifically complete study of these patients both pre- and post-operatively, and on their surgical results in operating upon these gravely debilitated patients.

Anesthesia in Tracheo-Bronchial Procedures*

LEON L. TITCHE, M.D.

Tucson, Arizona

This paper does not attempt to advance anything new in the technic of bronchoscopy or bronchography, but we wish to report what we consider to be a safe and efficient anesthetic agent, which others have declared to be a dangerous drug. This substance is pontocaine (p-butyl-aminobenzoyl-dimethyl-amino-ethanol). After having had unfortunate experiences with other topical anesthetics, pontocaine was tried and the results were so satisfactory that it has been employed for topical anesthesia to the exclusion of other preparations.

Pontocaine has been used by us for topical anesthesia of the pharynx, larynx and trachea in bronchography and bronchoscopy. Our procedure consists in administering sodium pentobarbital grains one and one-half (0.1 Gm.) one-half hour prior to bronchography. Preceding bronchoscopy, sodium pentobarbital grains one and one-half (0.1 Gm.) is given one hour before the contemplated procedure and dilaudid grains one thirty-second (0.002 Gm.) with scopolamine grains one two-hundred (0.00037 Gm.) one-half hour before. Anesthetization is the same in both instances. The pharynx is sprayed twice with pontocaine 2 per cent containing one drop of epinephrine 1-1000 to each cubic centimeter, using an average of 1.5 cc. For laryngeal and tracheal anesthesia, a one-half per cent solution of pontocaine also containing one drop of epinephrine 1-1000 to each cubic centimeter is instilled with a syringe and cannula in one cubic centimeter amounts at intervals of two or three minutes for four doses. This produces sufficient anesthesia to abolish the cough reflex for a long enough time to permit unhurried endobronchial procedures, but shortly afterwards the effect has worn off and the patient is able to clear his tracheobronchial tree of secretions, which is a decided advantage.

A review of the literature, we believe, will show why our results have been so favorable while others were not. Putney⁶ employed pontocaine 1 per cent for topical anesthesia of the pharynx and larocaine (1-p-aminobenzoyl-2-2-dimethyl-3-diethylamino-propa-nol) 2 per cent for instillation into the trachea. He states: "The anesthetic power of 1 per cent pontocaine corresponds to that produced by 10 per cent cocaine, while 2 per cent larocaine is

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equivalent to twice that strength of cocaine." We feel that a 20 per cent solution of cocaine would be a very dangerous anesthetic for this type of work. Moorhead⁵ found that close to one-half of his correspondents used 10 per cent cocaine by some method, the remainder being divided as to larocaine, pontocaine, and Forester's solution. One observer wrote that "pontocaine has occasionally seemed toxic, but larocaine has never produced the slightest sign of toxicity; however, the pontocaine is not quite so effective as cocaine, the larocaine is definitely less effective." Jackson and McReynolds⁴ objected to pontocaine because it would frequently precipitate an attack in asthmatic patients and because of its tendency to cause an irritation which may persist for several days. In spite of this they used the drug extensively except in asthmatic patients.

Criciani and Nogeura¹ were able to produce an asthmatic crisis in all of their asthmatic patients by the intratracheal instillation of pontocaine and found that the same substance produced no attack in normal persons. They believed that this was due to the stimulation of the unstable vagosympathetic system which exists in asthmatics.

Thomas and Fenton⁷ reviewed the literature and reported eight instances in their experience of reactions to pontocaine. In all of these, amounts from five to ten cubic centimeters of a 2 per cent solution were used. They made patch tests with cocaine and pontocaine in a number of allergic individuals and found that less than one-half per cent gave positive reactions to cocaine, while over nine per cent demonstrated sensitiveness to pontocaine.

Hansen and Stealy³ reported sudden death following gargling with four cubic centimeters of 2 per cent pontocaine preceeding gastroscopy. Derbes and Engelhardt² reported five deaths following the use of either pontocaine or cocaine or both prior to bronchography. In all of their cases except one, the amount of pontocaine used was over two cubic centimeters of the 2 per cent solution.

We have used pontocaine for anesthesia in 496 bronchoscopies on 264 patients and in 103 bronchographies for the diagnosis and treatment of pulmonary tuberculosis, bronchiectasis, and bronchial asthma. Except in two instances, no untoward effects were observed. The first was a white male 27 years of age who had been diagnosed as bronchial asthma, but symptoms of bronchiectasis appeared. Bronchography was performed without incident and did not reveal any evidence of bronchiectasis. Two weeks later the patient requested that another instillation of the iodized oil be given because he had felt so much better following the bronchography. This was attempted. Anesthetization was uneventful,

but a few minutes after the instillation of the oil, the patient became cyanotic and respirations ceased. Following the administration of epinephrine and aminophyllin and oxygen, he was revived and later did not show any ill effects. Evidently this was due to either allergic shock to the iodized oil as reported by Mahon⁵ or to the oil acting as an obstructing medium as Waldbott⁹ believes.

The second instance was in a white male, age 53 years, who had arrested pulmonary tuberculosis. Symptoms of bronchiectasis caused him to be referred for bronchography. Following anesthetization, he developed wheezing, and in view of our previous experience, the iodized oil was not instilled. The wheezing subsided without any medication being necessary. Possibly this case was of the type described by Criciani and Nogeura.¹

Patch tests with pontocaine 2 per cent were made on 20 patients (none of whom had had bronchoscopy or bronchography) without obtaining the slightest reaction, though all of these had been diagnosed as having bronchial asthma. This is not a reliable indication of sensitiveness since Derbes and Engelhardt² point out: "While patch tests to drugs causing contact dermatitis are highly specific and reliable, drugs which cause trouble following parenteral administration often can not be satisfactorily tested either by patch tests, scratch tests, or intracutaneous tests."

CONCLUSIONS

We feel that the poor results previously reported have been due to using too large an amount of the drug. The manufacturer advises that not more than one cubic centimeter of the 2 per cent solution or equivalent amounts of other strengths be instilled intratracheally. In the reactions which have been observed, amounts far in excess of this have been used. While the total amount of pontocaine used by us exceeds the advocated quantity, we feel that the addition of epinephrine to the solutions as advocated by Fussganger and Schaumann² permits this. The epinephrine slows the rate of absorption of the drug and thereby allows detoxification to take place in the liver.

From our observations we believe that pontocaine is an excellent drug for anesthesia of the upper respiratory tree if it is used properly. Reactions will continue to be observed as long as overdosages of the drug are administered.

CONCLUSIONES

Estamos convencidos de que los malos resultados anteriormente comunicados se han debido al empleo de una cantidad muy grande de la droga (pontocaína). El fabricante aconseja que no se instile

en la tráquea más de un centímetro cúbico de la solución al 2 por ciento, o de cantidades equivalentes de otras concentraciones. En las reacciones observadas las cantidades que se han empleado han sido muy en exceso de esas. Aunque la cantidad total de pontocaína usada por nosotros excede la cantidad aconsejada, opinamos que la adición de adrenalina a las soluciones, como lo recomiendan Fussganger y Schaumann,² lo permite. La adrenalina retarda la velocidad de absorción de la droga y de tal modo permite que la detoxificación tenga lugar en el hígado.

Basados en nuestras observaciones opinamos que la pontocaína es una droga excelente para anestesiarse las vías respiratorias superiores, si se la usa correctamente. Se continuarán observando reacciones mientras se administren dosis excesivas de la droga.

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The Significance of the Time Element in Tuberculous Infiltrations*

H. A. BURNS, M.D., F.C.C.P.**

Saint Paul, Minnesota

The time factor used between a roentgenogram in surveys and in case finding tuberculosis control programs has been variously estimated to be between one and five years. Such programs are usually designed so that the basis of the diagnosis of tuberculosis is on the findings of the roentgenogram.

During the past twenty years, our control of contagious diseases and our prenatal care, as well as our protection of infants and children, has brought an ever increasing number of men and women into advanced age groups where they eventually become identified with the increasing incidence of clinical conditions some of which were formerly rare as a known cause of illness or death. The reflection of this shift was early demonstrated in our state hospitals. However, it is not a condition characteristic of, or limited to, the hospital population, but rather, it is one that affects the total population.

The first and most startling evidence of this shift in our incidence of diagnosis has been the marked increase in cases of cerebral arteriosclerosis among those coming to our hospitals for the mentally ill. The prolonging of the period of longevity has kept many children who would have been victims of contagious diseases but who are saved later to fall victims to chronic and degenerative diseases. In the interval there have been many of these individuals surviving various pulmonary diseases that have occurred without being identified until found through the examination of the roentgenogram in survey work. As a part of the normal incidence of disease, the roentgenogram has helped us in revealing pulmonary shadows, the significance of which can only remain mute evidence of a past experience. The roentgenogram of this new group of people now permitted to live into the later years of life present a film of the chest which frequently shows evidence of disease that a few years ago would not ordinarily be found in routine clinical investigation.

The increase in tumors of the lungs is at least in part due to a greater number of people living through to the tumor age. We

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**Tuberculosis Control Unit, Division of Public Institutions, State of Minnesota, Saint Paul, Minnesota.

are finding more evidence of pulmonary changes because we are getting more and more people past the ages that formerly took them from causes that are no longer of serious danger either to life or health. We now find frequent evidence of atelectasis, bronchiectasis, cystic, and other changes that were only occasionally seen in the life of a busy practitioner or roentgenologist of a few years ago. Infiltrations of various sizes and densities with variable amounts of fibrosis or calcification were easily grouped as more or less characteristic of tuberculosis infection even without evidence of toxemia or bacteriological findings. The incidence of tuberculosis infection was so common that the tuberculin test was only occasionally used as an aid in diagnosis. Now we find that calcification, previously recognized as positive tubercle infection, may be caused by a number of conditions such as coccidio-*idosis* and *histoplasma capsulatum*. We now also recognize the tuberculin test as one of the more efficient laboratory tests.

With the many shadows found in the pulmonary field, the diagnosis of tuberculosis still remains a clinical problem and one that must continue to be the responsibility of the clinician for the diagnosis and the responsibility of the bacteriologist and epidemiologist for control. An unusual number of individuals showing shadows on the roentgenogram has been found by the more general use of the x-ray. This has become more apparent with extensive surveys and through the work carried on in induction centers during the late war.

Our experience, extending over a period of years, has been chiefly limited to the Lymanhurst Center, the Minnesota State Sanatorium which served forty-seven counties, the hospitals in Minnesota for the mentally ill, and inductees who later developed tuberculosis among Minnesota troops entering service. The repetition of serial roentgenograms of an institutional population brings out facts that seem to be the common experience of those who are examining a large number of any exposed group of individuals. In our state institutions for the mentally ill, we have a heavily infected group with contact exposure extending over a considerable period of time often in excess of one year. Because of their mental condition, they are not satisfactory patients so far as therapy is concerned, yet there are many reasons to conclude that the usual tuberculous infection, even among these patients, tends to recover. In support of this statement, repeated contact with open cases of tuberculosis under the most favorable circumstances for infection and reinfection has not changed the tendency shown by a large number of these infectees to recover. This, over a period of years, leaves a residual showing pulmonary shadows that become a problem for the clinician and laboratory. Following any survey,

the time element in the development of tuberculosis infiltrations is of great importance since most of our observation begins at a variable period following the onset of the infiltration.

In our 16,000 inmate patient population where contact with open cases of tuberculosis has been much more uniform than in the population in the state as a whole the institutional population shows an infection rate of over ninety per cent. At the present time we have 2784 cases who show some pulmonary changes on the roentgengram. There are approximately 500 cases that show pulmonary shadows which are due to conditions other than tuberculosis. This leaves a load of 2284 cases of tuberculous infection, 269 of whom are proven positive carriers of pathogenic acid-fast organisms. There are 290 cases in isolation with lesions that are considered active but who have not been proven bacteriologically positive at this time. The pulmonary shadows shown are usually located in the apical area. These shadows have remained stationary over a four year period with films taken from six to twelve month intervals. Bacteriological specimens taken at three to twelve month intervals have remained negative. It is important to note that these cases do not contribute to our isolation facilities. They add much, however, to the demands upon the laboratory and the time and services of the clinician. As found in our routine, they do not make a significant contribution to our institutional health problem. If they were ever open cases of tuberculosis, the infiltration as it now remains shows no evidence of activity.

There have been 326 members of the military forces of the late war hospitalized in Minnesota up to this time. While the induction films on these cases are not often available, it was possible to analyze ninety-seven cases on the basis of later breakdown. There was one whose induction film was negative who broke down in less than one month, one in less than three months, six in less than six months, thirteen in less than one year, and twenty-five who first developed evidence of tuberculosis after one year's time. There were fifty-one cases that showed evidence of parenchymal infiltration on induction films. Thirty-one of these definitely broke down within one year and twenty after one year. In a study of this group of cases, it seemed evident that the original infiltration developed rather quickly, the borders of the lesion, whether minimal or extensive, tending to remain stationary. Later extensions, as revealed by those coming into the service with an early infiltration established, indicated the extension from this early site to be due to factors other than those that determined the original spread. Living conditions, camp life, boot-training, and the usual activities of camp and field routine aided in the extension of the infiltration.

The finding of pulmonary shadows through surveys increases the clinical responsibility of the doctor in diagnosis and in determining activity of those cases identified on the roentgenogram as being tuberculous. A small number of these cases have become progressive and so remained until death. It is important to determine the conditions and the duration of the infiltration as found in these cases. While our data are not sufficiently complete to reduce it to percentages, we feel that the rapid infiltrations reaching their peak within a short period of time are more common than otherwise, and it is our experience so far that, if we are to identify the case early, which is important in order to limit exposure to contacts and to initiate satisfactory therapy, the clinician must be brought in to evaluate symptoms and diagnose the case. The identification of cases in surveys depends largely on the roentgenogram and must be based on repetition of the films at a much more frequent interval than is usually considered necessary. We are throwing a tremendous load on the roentgenogram which in the end can only pass the work along to the clinician for final evaluation of the data and diagnosis of the condition. In relation to the uniformity of rapid infiltrations that reach a peak within a short period followed by a tendency to absorb or fibrose, this group may or may not have been identified early. Bacteriologically, they almost uniformly become negative and remain so for the duration of their observation. We do not find that this group of cases make any material contribution to our case load. Reactivation and breakdown are conditions which in our experience in state hospital work have not been frequently observed. In this group, twenty per cent of the cases identified by shadows have shown evidence of active disease, one half of this group have been proven bacteriologically positive over one year ago and have since been convalescing with negative gastric lavage, while the remaining cases continue to be positive up to the present time. During the past four years, the 1828 cases under observation with shadows on the roentgenogram have shown no change and have remained bacteriologically negative.

SUMMARY

The establishment of the original tuberculosis infiltration following the primary infection has been discussed from the clinical and epidemiological point of view. The evaluation of old lesions relative to later changes in the infiltration has been reviewed in a group of cases that have been observed over a period of time from one to four years. The time during which the pattern of infiltration becomes set is discussed in relation to the current

tendency to confine case finding programs to x-ray surveys on an interval of one to five years.

The large group of individuals showing shadows, usually apical, has been discussed in relationship to the total tuberculosis load requiring continued follow-up supervision. These cases, apparently minimal at the peak of development, have remained consistently negative for the period observed having had at least one series of one to four gastric lavage examinations per year. We do not find our positive cases or our reactivations among this group of patients, in fact, a very considerable number of active cases are not found to be associated with any older evidence of a tuberculosis infection other than a positive tuberculin test. The time element involved between the positive reactors and the onset of symptoms leading to progressive tuberculosis has not yet been determined. A positive tuberculin reaction is the first requirement in the development of clinical disease. There has been no apparent relationship between the recently developing tuberculin positive case and early breakdown with tuberculosis. The inactive cases shown by apical shadows at the present time represent over seventy-five per cent of the total number found on x-ray among our mentally ill. It would seem that this group which does not require therapy or isolation for control purposes must remain of historical interest only.

CONCLUSIONS

The shift in diagnosis of diseases of the chest resulting from the prolongation of the period of longevity has brought many new problems into our field. The roentgenogram must remain an important element in the internist's inspection of the chest along with the tuberculin test, history of exposure, physical signs, and possibly the most neglected and most important, the further refinement in our bacteriological identification and later control of the open case of tuberculosis.

Because of the variability of shadows on the roentgenogram resulting from conditions developing through our changing periods of longevity, there has been created a clinical problem of evaluation of new shadows regardless of location as well as possible changes in old shadows. The interpretation of old lesions relative to changes in the infiltration can be of little value to us in our control program unless it be associated by the internist and bacteriologist with their clinical and bacteriological findings. Both the beginning and end of the identification and treatment of tuberculosis has become a challenge in the differential diagnosis to the family doctor and the internist.

The repetition of x-ray surveys is important for case finding

purposes in special groups. However, tuberculosis, as we see it, is largely limited to the family and the relatively small community group where dependence upon surveys would permit many cases to develop advance disease waiting for a routine survey to be held.

There is a tendency even now to procrastinate in the handling of the tuberculosis problem as an individual one in favor of the later promotion of survey work. Individuals who should be under monthly or frequent check-up, who are coughing and showing symptoms following definite exposure to open cases and who react to tuberculin, are being permitted to continue their activities waiting for a survey set-up to become established or to get to their community in order to find out their own status.

These early infiltrations becoming established over a short period of weeks or at most a few months again emphasize the fact that the diagnosis of tuberculosis cannot be separated from medical practice. The patient-doctor relationship maintained can help in the effective execution of any contagious disease control program while routinising the control technique may defeat the very objective for which it was created.

CONCLUSIONES

El cambio en el diagnóstico de las enfermedades del pecho ocasionado por la prolongación del período de longevidad ha traído muchos nuevos problemas a nuestro campo. La roentgenografía debe continuar siendo un importante elemento en la inspección del pecho por el internista, junto con la prueba tuberculínica, la historia de exposición, los signos físicos y, lo que es posiblemente lo más descuidado y más importante, a saber, el refinamiento adicional en nuestra identificación bacteriológica del caso abierto de tuberculosis y su control subsiguiente.

Debido a la variabilidad de las sombras en la roentgenografía, causadas por estados que se han desarrollado por razón del cambio en los períodos de longevidad, ha surgido el problema clínico de avaluar tanto las nuevas sombras, prescindiendo de su ubicación, como posibles alteraciones en viejas sombras. La interpretación de viejas lesiones con respecto a alteraciones en la infiltración nos será poco valiosa en nuestro programa de control, a menos que la asocien el internista y el bacteriólogo con sus hallazgos clínicos y bacteriológicos, respectivamente. Tanto el principio como el fin de la identificación y del tratamiento de la tuberculosis han llegado a ser para el médico de familia y el internista un desafío al diagnóstico diferencial.

La repetición de censos radiográficos es importante para el fin de descubrir casos en grupos especiales. Empero, la tuberculosis, en la forma en la que la encontramos, está limitada en gran parte a

la familia y al grupo relativamente pequeño de la colectividad, donde, si se dependiera de censos, se podría desarrollar enfermedad avanzada en muchos casos mientras esperaran que se llevara a cabo un censo sistemático.

Existe la tendencia aún ahora de aplazar la consideración de la tuberculosis como un problema individual y de preferir la realización posterior de investigaciones de censo. A individuos que deberían ser examinados cada mes o frecuentemente, que andan tosiendo y que manifiestan síntomas consecutivos a exposiciones bien definidas a casos abiertos, y que reaccionan a la tuberculina, se les permite que continúen sus actividades mientras se espera que se establezca un programa de censo, o que llegue a su colectividad, a fin de descubrir su condición.

Estas infiltraciones precoces que aparecen en un corto período de varias semanas, o a lo más unos pocos meses, recalcan de nuevo el hecho de que el diagnóstico de la tuberculosis no puede ser separado de la práctica médica. El mantenimiento de la relación entre el paciente y el doctor puede ayudar a la ejecución eficaz de cualquier programa de control de enfermedades contagiosas, mientras que si la técnica de control se vuelve rutinaria, ello puede frustrar el mismo objeto que inspiró su creación.

Discussion

H. I. SPECTOR, M.D., F.C.C.P.*

St. Louis, Missouri

Dr. Burns' timely paper brings to our attention many interesting points. There is no question that our control of the communicable diseases and the generally improved living conditions has led to a prolongation of life and with it an increase in the incidence of the chronic diseases of adult life such as cancer of the lung and the cardio-vascular diseases.

For instance, it is not uncommon to see a patient recover from tuberculosis and live long enough to develop cancer of the lung and die from the disease. This fact makes the interpretation of the clinical picture as well as the x-ray shadow of the chest in general more difficult. While a certain apical lesion in a person at the age of 20 may easily be interpreted as that of tuberculosis, the same lesion in a person past 50 may present difficulties in interpretation because of the frequency of other pulmonary conditions at this age group. Interpretation becomes especially difficult in these patients with a previous history of tuberculosis in

*Deceased.

early life from which they have recovered. We know that our tuberculous population now lives longer than in former years. In a 25 year statistical study from the viewpoint of longevity and mortality that we made in St. Louis a few years ago, we confirmed Drolet's finding that while the ultimate chances of dying from tuberculosis has not changed, the newer methods of treatment have at least led to a prolongation of life. In our own group from 33 to 47 years, in other words the average tuberculous patient now lives almost 14 years longer than previously—thus every tuberculous patient is a potential candidate for the development of those chronic lung conditions incidental to the older age groups and because of this fact interpretation of the clinical picture and especially the x-ray shadow in general becomes more difficult.

In view of the present tendency for case finding through mass roentgenography, it becomes increasingly important to remember the limitations of the x-ray and mass radiography in general in accurate diagnosis of chest conditions. After all, the roentgenogram shows a density which may or may not have clinical significance. In final analysis, the proper interpretation of this density must be based not only on the roentgenogram but also on the history, physical examination, laboratory tests and with these a common sense interpretation of the facts in the case.

Discussion

J. A. MYERS, M.D., F.C.C.P.
Minneapolis, Minnesota

Dr. Burns has presented several important phases of tuberculosis control work. For many years I have been deeply interested in one of them; namely, the short interval of time that may exist between clear films of the chests of tuberculin reactors and the appearance of moderately or far advanced tuberculosis. Prior to making these observations I believed and taught that chronic pulmonary tuberculosis always begins as microscopic lesions which slowly evolve, attaining the proportion of gross lesions which cast x-ray shadows after many months or years, following which there is a period of two or three years before they produce symptoms or become contagious. Such a concept made the control of the disease appear simple in any given individual. All one had to do was ferret out the adult tuberculin reactor, make x-ray inspection of the chest every year or so and when a shadow appeared, use the available method to diagnose the etiology. Those lesions that were proved to be tuberculous could usually be controlled by

prompt treatment before the disease was contagious or caused significant symptoms.

Observations lead me to believe that this situation does obtain in a majority of persons who develop chronic pulmonary tuberculosis. However, there is a definite minority who, in less than a year and often in less than six months from the time the films of the chest are clear, present shadows of extensive disease. How often this occurs among those who develop chronic pulmonary tuberculosis I have not had an opportunity to determine. It seems probable that Dr. Burns will be able to ascertain the percentage of individuals in whom this happens through the continuation of his present studies. In any event, I am convinced that the number is sufficiently large to justify definite modification in the follow-up program of tuberculin reactors. Such cases have occurred with sufficient frequency in the groups under my observation that I am satisfied that any program which provides for x-ray inspection of the chests of adult tuberculin reactors only one in two, three or five years is inadequate. In fact, I am ready to recommend that adult tuberculin reactors have x-ray inspection of the chest at least every six months, rather than annually, as was previously advised. In many parts of the United States this is now a physical possibility. It should become so everywhere, inasmuch as the in-

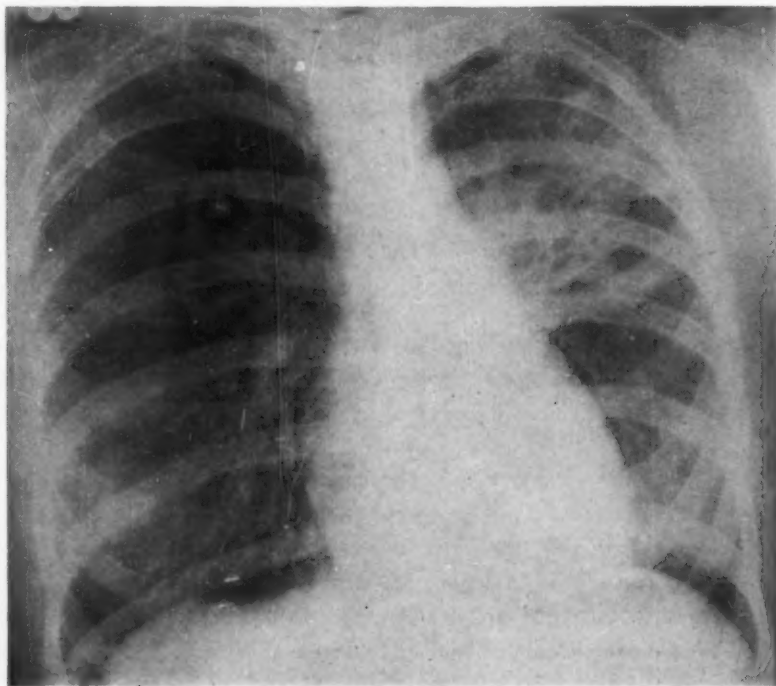


Figure 1

cidence of tuberculin reactors among adults is relatively low. For example, in an appreciable number of colleges and universities of this country less than 10 per cent of the students react to tuberculin. Thus, in a school of 5,000 students there are less than 500 reactors. Inasmuch as clinical tuberculosis appears only in the bodies of tuberculin reactors, it is far better to ferret out the reactors and make x-ray inspections of their chests every six months than to dissipate funds, time and effort of students and personnel alike by making x-ray inspections of the chests of the full 5,000 every year or so.

Probably the majority of these "sudden appearing" lesions are due to bronchogenic spread of tubercle bacilli from lesions of primary tuberculosis complexes, such as a caseous lymph node, or in some cases even the primary focus itself. The majority of such primary lesions are not demonstrable by x-ray before or after the dissemination occurs. However, such persons are always tuberculin reactors before the dissemination takes place. More-

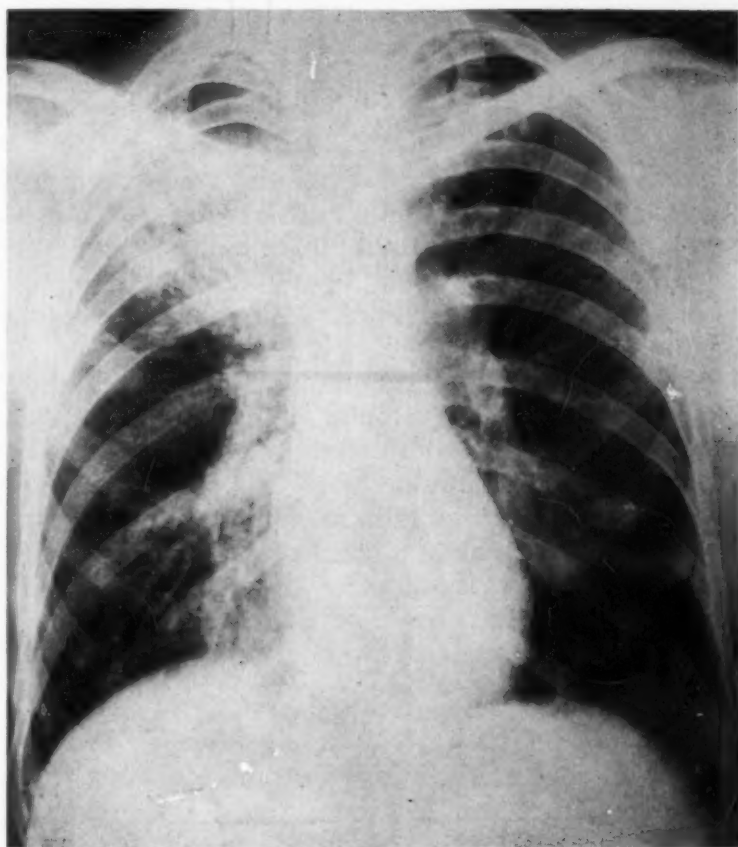


Figure 2

over, in all such cases the primary tuberculosis complex is to be found at postmortem examination, regardless of the cause of death.

The sudden appearing lesions are nearly always exudative in character. Often tubercle bacilli are already present in the sputum when they are first detected. They may resolve with considerable promptness, ultimately leaving no x-ray shadows. Again, they may take on the characteristics of both exudative and productive tuberculosis, and after resolution occurs strands of scar tissue may remain. On the other hand, the disease may progress to cavity formation; therefore, prompt treatment is indicated, not only in an attempt to restore the individual's health, but also to protect the community against contagion.

In Figure 1, there is evidence of extensive disease which proved to be tuberculous in the left upper lung field. One year before, when this girl was eighteen years old, she was found to be a reactor to tuberculin. Then and six months later, however, the x-ray films of her chest were entirely clear. Therefore, the disease in the left upper lobe (Figure 1) became demonstrable some time during the six-months interval between films. No symptoms whatsoever were present which would have caused her to seek examination.

In Figure 2, there is evidence of extensive disease in the right upper lung field of a man of thirty-five years. Because he was a reactor to tuberculin periodic examinations had been made for several years. However, the films of his chest were entirely clear, up to and including the one made three months before Figure 2 was taken.

Because these rapidly appearing lesions have not been emphasized sufficiently to the medical and nursing professions, as well as the general public, physicians are frequently severely criticized when no evidence of disease is found on one date but within three to six months tuberculosis is detected in an advanced stage. While it is true that small shadows on x-ray films are often overlooked or ignored, as so often occurred at induction centers during World War II, it is also true that in a considerable number of advanced cases there was no x-ray evidence whatsoever on films made only a few months before. Such cases serve to re-emphasize the tuberculosis potentialities among adults who at the moment have no demonstrable evidence of tuberculosis except the tuberculin reaction.

Oleothorax

W. L. MEYER, M.D., F.C.C.P.*

Sanator, South Dakota

During recent years there has been a definite trend toward the discontinuation of this useful therapeutic procedure. I feel that there is a definite place for this procedure, both for the controlling of a clinically satisfactory pneumothorax that is obliterating and in the treatment of certain cases of tuberculous empyema.

In the first place an oleothorax is a much simpler procedure than a thoracoplasty. The morbidity and mortality is definitely lower than with a thoracoplasty. In our entire series of cases we have not had a death that can be traced to the use of oil. There is much less deformity and this fact has a very definite bearing on many individuals, particularly the younger ones. In some selected cases the results will be as satisfactory as with an extensive and deforming thoracoplasty. It will be noted that the cases must be selected with care and it is not being maintained that all cases of obliterating pneumothorax or all cases of tuberculous empyema are suitable for this form of treatment.

During the past four years seven patients have been treated by the use of oleothorax because of an obliterative pleuritis. Of these seven cases, six have developed this condition as a result of a hydropneumothorax, and the oleothorax was instituted to prevent the loss of the pleural space. In each case the pneumothorax was clinically satisfactory, the sputum was consistently negative. Radiographically the pneumothorax showed adequate control of the disease when the oleothorax was instituted. However, because of the tendency for the lung to re-expand during the presence of the hydropneumothorax the oleothorax was instituted. In each of these cases the oleothorax prevented the lung from re-expanding and the collapse has been clinically satisfactory. In none of the cases in which a simple hydropneumothorax was present, were we able to detect the presence of any organism, either tubercle bacillus or secondary invader, in the pleural effusion.

Six of these patients are still maintaining their oleothorax. Five of them are working at this time. One patient has had a reactivation of disease in the contralateral lung. There has been no indication of reactivation in the ipsilateral lung. The seventh patient died during a minor surgical procedure for a rectal ailment, perhaps as a result of an idiosyncrasy to the anesthetic used.

*South Dakota State Sanatorium.

Four patients have had oleothorax for empyema. In all cases the empyema has been a pure tuberculous infection. In two cases the empyema has completely cleared up and there has been no evidence of any fluid formation under the oleothorax. The last fluid that it was possible to aspirate in each of these cases contained a few organisms that stained as typical tubercle bacilli but it was impossible to grow them in a culture and the guinea pig injected with the material did not show evidence of infection. It was thought that the few bacilli present were in such an attenuated form that they were non-viable. In two of these cases the pneumothorax had partially re-expanded so that the upper lobe was collapsed and there was no collapse of the lower one-half of the lung. Consequently the oleothorax was limited to only a comparatively small portion of the lung. There was less destruction of lung tissue than if a thoracoplasty had been performed. The deformity that would have been present with a thoracoplasty was eliminated, and these patients both have satisfactory collapse and control of their empyema.

The remaining two cases both had a tuberculous empyema. The oleothorax was instituted to control the empyema and to increase the collapse. In both cases the sputum had been positive and negative for several months before the oleothorax was instituted. It was hoped that the control of the empyema and the slightly greater collapse would result in a consistently negative sputum. This was not the result however, and the oleothorax had to be aspirated. A subsequent thoracoplasty did control the disease. In both of these cases the disease was so extensive that even though an oleothorax had not been employed, collapse of the entire lung would have been necessary. It is therefore not possible to say, in these two cases, that the oleothorax has resulted in thickening of the pleura with destruction of lung tissue that could have been saved if a thoracoplasty had been instituted during the early stage of the disease.

In none of our cases, in which the oleothorax was instituted to control an expanding pneumothorax, did we fail to secure satisfactory results. In none of the cases has the sputum again turned positive. We have had no cases in which fluid had formed under the oleothorax in which aspiration several times has not completely controlled the fluid formation. In none of the cases has an empyema developed when this treatment was instituted for an obliterative pleuritis. We have had no instance in which there has been a rupture of the visceral pleura and expectoration of the contents of the pleural cavity.

It has been our custom to institute an oleothorax by the injection of a few cc. of 5 per cent gomenol in mineral oil into the

pleural space. An attempt is made to remove any fluid that may be present before the injection of the oil. Usually a reaction will be present for several days. Temperature may increase to 101° F. Frequently some fluid will form, but in a few days the immediate reaction will subside. If fluid is still present it should be aspirated and more 5 per cent gomenol in mineral oil injected. It is improbable that a reaction will follow this injection. Several days later a larger amount of gomenol in mineral oil may be injected. At this time the amount injected is usually 50 to 100 cc., depending on the size of the pleural space and the reaction to the previous injection. Before each subsequent injection any fluid that has formed should be aspirated from the most dependent portion of the pleural space. The desired amount of oil is then injected and the intrapleural pressures brought to approximately atmospheric. I feel that it is well to almost completely fill the pleural space with oil during the first few injections. The oil is allowed to remain and the chest is closely watched for the formation of fluid under the oleothorax. This is aspirated as it forms. When fluid has stopped forming the remaining space can be filled with oil and after that it should be maintained at about atmospheric pressure and checked at from four to six month intervals. Usually only several cc. of oil will be required to maintain atmospheric pressure.

CONCLUSIONS

I feel that there is a very definite place for oleothorax in the treatment of pulmonary tuberculosis.

(1) An oleothorax can maintain a satisfactory collapse in the face of an obliterating pleuritis, if the pneumothorax is clinically satisfactory before the oleothorax is instituted.

(2) In certain selected cases 5 per cent gomenol in mineral oil will render a tuberculous empyema sterile, or at least will so attenuate the organisms that they will not grow either in culture or cause tuberculosis in guinea pigs.

(3) Five per cent gomenol in mineral oil has proven the most satisfactory in our hands. In previous cases other materials have been used in place of gomenol. These have been found satisfactory in so far as they have been used in cases of obliterative pleuritis. They have not proved so satisfactory in cases of tuberculous empyema.

CONCLUSIONES

Estoy convencido de que existe un lugar bien definido para el oleotórax en el tratamiento de la tuberculosis pulmonar.

(1) El oleotórax puede mantener un colapso adecuado, no obs-

tante la existencia de una pleuritis obliterated, si el neumotórax es clínicamente satisfactorio antes de que se practique el oleotórax.

(2) En ciertos casos seleccionados el gomenol al 5 por ciento en aceite mineral volverá estéril un empiema tuberculoso, o por lo menos atenuará tanto a los gérmenes que no se reproducirán en cultivos ni causarán tuberculosis a cobayos.

(3) En nuestras manos el gomenol al 5 por ciento en aceite mineral ha resultado ser el más satisfactorio. En casos anteriores se han usado otras sustancias en lugar del gomenol. Estas otras sustancias han sido satisfactorias cuando se emplearon en casos de pleuritis obliterated, pero no han sido tan satisfactorias en casos de empiema tuberculoso.

Coccidioidomycosis in Phoenix, Arizona

HOWELL RANDOLPH, M.D., F.C.C.P.

H. L. McMARTIN, M.D.

Phoenix, Arizona

Interest in the incidence of coccidioidomycosis throughout the desert areas of the western slopes of the Rockies and the southwestern desert country has been accelerated by studies made at the airbases and by the many new endemic foci which have been discovered during the past three years. The purpose of this study is to attempt to evaluate the importance of this infection in the civilian population of Phoenix and environs. Data have been accumulated that indicate that a large percentage of the population has been sensitized to the fungus. This observation is based largely upon the use of the coccidioidin skin test. Its significance seems to parallel to a large extent the significance of the tuberculin test. The diagnosis of this disease must in the majority of cases be based upon clinical manifestations, x-ray findings, and a positive coccidioidin test. It is rarely possible to make an absolute diagnosis because it is only occasionally found that the organism can be recovered on sputum examinations and by staining methods. Furthermore, the advisability of culture examinations in the laboratory is questioned because of the hazard from cultures to the laboratory technician.

In the last twenty years knowledge of coccidioidomycosis infections has progressed from the recognition of the extensive granulomatous lesions of the lungs, bones and joints, frequently terminating fatally to the present time when we know that infection with the fungus is usually mild and transitory and produces subclinical lesions more frequently unrecognized than diagnosed.

The studies of Smith and others from 1937 to 1940 demonstrated that the San Joaquin Valley was the principal endemic area of the Pacific Coast and that there is a close relationship between coccidioidomycosis and erythema nodosum and erythema multiforme. Farness focused attention on the problem of coccidioidomycosis infection in the desert area of the Southwest by reporting ten cases in southern Arizona. Aronson, et al,³ in a study of Indians in the central Arizona desert areas found a large percentage reacting positively to coccidioidin, many of whom had negative tuberculin reactions yet calcification showing in chest x-ray films. Of 700 persons examined, 14.7 per cent reacted negatively to the tuberculin test but gave positive coccidioidin reactions. This further demonstrated the similarities between hyper-

sensitivity in tuberculosis and coccidioidomycosis. Butt,⁴ in 1945, reported the coccidioides fungus forms in the capsule and margin of calcified lesions in individuals dying from other causes. In these individuals tuberculin tests had previously been done and were negative. Santa Fe Railroad employees in California, Arizona, and New Mexico showed 25.4 per cent positive coccidioidin reactions. Emmons and Ashburn⁵ found coccidioides immitis in 15 to 16 per cent of rodents in the San Carlos and central Arizona desert area. Stiles and Davis⁶ list many animals as host carriers. These findings mark progress in working out the epidemiology of coccidioidomycosis infections.

A survey of Phoenix public schools made at the instigation of Capt. Lewis T. Bullock and carried out by the Public Health Department under one of us (H. L. McMartin), reveals the following:

TABLE I—COCCIDIOIDOMYCOSIS SURVEY
Phoenix, Arizona, March-April, 1943

	Total Tested	Positive		Doubtful		Negative	
		No.	Percent	No.	Percent	No.	Percent
<i>Junior College:</i>							
M.	74	46	62.2	5	6.8	23	31
F.	53	38	71.2	2	3.8	13	24.5
Total	127	84	66.1	7	5.5	36	28.4
<i>Arizona Vocational School:</i>							
M.	41	21	51.2	2	4.9	18	43.9
F.	55	27	48.8	2	3.7	26	47.3
Total	96	48	50.0	4	4.1	44	45.9
<i>Phoenix Union and North Phoenix High School (white):</i>							
M.	332	197	59.3	14	4.2	121	36.5
F.	699	403	57.6	38	5.4	258	36.9
Total	1031	600	58.2	52	5.0	379	36.7
<i>Phoenix Colored High School:</i>							
M.	32	27	84.3			5	15.7
F.	62	39	62.9			23	37.1
Total	94	66	70.2			28	29.8
Grand Total	1348	798	59.2	63	4.7	487	36.1

Material used: Coccidioidin 1:100 dilution in N. Saline. Obtained from C. E. Smith, M.D., Stanford University Medical School.

The fact that few of these individuals reacting positively to coccidioidin give history of the clinical disease clearly indicates that in a great majority of cases infection is transitory and mild. An attempt was made to correlate the skin test with the length of residence in Arizona. It was noted from the questionnaires that were filled out by those submitting to the test that the

percentage of positive reactors increased with the length of residence in this area. There was less than one per cent who gave history of erythema nodosum or erythema multiforme. Some of our positive reactors had been in this area less than six months and in several of these histories of recent influenza-like respiratory infections were obtained.

In order to give some idea of the clinical incidence of diagnosable coccidioidomycosis infections we wish to present the experience covering a period of the last five years in Phoenix. During this time it has been our privilege to examine most of the patients in whom x-ray evidence of chest pathology was present, brought to light by the Maricopa County Health Unit, the Maricopa County Clinic of Phoenix, Arizona, and the State Tuberculosis Sanatorium, and to see many cases in private practice. Where the diagnosis of tuberculosis in these patients was doubtful a study for possible coccidioidomycosis was made.

In our series of cases two patients developed serious prolonged disabling pathology. The disease was self-limited in most cases and the active stage, with fever, cough or other symptoms seldom lasted more than a month and usually lasted only a few days. Cavity was present in three cases. Permanent changes on the x-ray film, represented by nodules or by fibrotic striation were present after recovery in six cases. Calcification as an end result, described by Butt⁴ and others, was demonstrated in one of these cases and some of them have small nodular lesions which have gone a long way toward calcification.

From these studies it is certain that *calcification on chest films cannot be taken per se as evidence of primary tuberculosis infection*, particularly in this area. It seems quite possible that in a certain percentage of the residents near Phoenix who have calcification, the changes are due to coccidioidal infection rather than to tuberculosis. Any public health survey should include a comparative study with this in mind. It can readily be seen therefore that mass x-raying of the population here would be somewhat different in interpretation than in the Middle-West. *It is not possible to make a definite diagnosis of tuberculosis on the x-ray film alone.* Bacteriological confirmation and skin tests are necessary for accurate diagnosis. Particularly is this true in interpreting the chest films of children. Since in children x-ray and clinical manifestations are sometimes identical in the two diseases the differential diagnostic value of the skin test is greatly enhanced. If both skin tests are positive, it may be impossible to arrive at a diagnosis before the child gets well, and possibly never.

There have been many rejectees in Arizona because of calcification shown in the x-ray films of the lung. If the lesions are

multiple and granular in character, rejection by the examining board has been usual. This procedure has been predicated upon the opinion that calcification was always due to tuberculous infection and that a predisposition to reinfection with tuberculosis existed. Many individuals were deferred six months for observation, then accepted if the lesions were stationary. It is now certain that some of these calcifications were due to fungus infection and it is thought that in none of these cases would reactivation of the mild coccidioidal infection be likely. This procedure pro-

TABLE II — All patients presented symptoms of an acute respiratory infection with cough and sputum at some stage but sputum was not obtainable at the time seen in several cases. The chest x-ray in the table was the initial film in most cases but the end result in cases 3 and 6. Gastric contents were cultured in four cases. Strict rest was employed only during the period of acute symptoms and weakness.

Case	Age	Residence in Arizona	Former Residence	Erythema Nodosum	Leukocytes	CHEST X-RAY
R.P.	15	Life. High School Boy		None	10,900	Small thin walled cavity, left 3rd interspace.
J.A.	27	2½ years	Utah	None		Small thin walled cavity, right 2nd interspace.
E.B.	39	20 years		None		Multiple calcification peribronchial thickening.
D.R.	23	Life. Worked at Lukefield		None	7,300 Eos. 3%	Medium sized cavity, right 2nd interspace, gradually filling.
J.B.	63	3 months. Lived on desert near Phoenix	Japan	2 wks.	6,600	Flouroscope — no definite chest abnormality.
E.B.	34	10 months. Sgt. at Lukefield	New Jersey	None		3 small healed nodules, 2nd interspace.
E.J.	15	Life		None	6,200 Eos. 3%	Small cavity, right lower lung field.
D.M.	32	2 months. Teacher	Cleveland, Ohio	Yes	12,600 Eos. 5%	Flouroscope — Diffuse increase in peribronchial and hilar shadows.
A.M.	64	1½ months. Desert picnic dust storm	Elmhurst, Illinois	2 wks.	7,800 Eos. 4%	Diffuse cloudy shadow, left lower lobe.
B.G.	15	4 months. High School student	Lima, Ohio	None	8,300	Diffuse cloudy shadow, upper right lung, clear in 10 days.
S.L.	4	Life. Lives on edge of desert in Mesa		Yes	19,500	

foundly affected the lives of many individuals and a revision of the evaluation of these lesions is indicated. Butt⁴ shows that multiple calcification is frequently the result of coccidioides immitis infection and that some of the large calcium deposits are due to this fungus. The ability to calcify probably corresponds to intrinsic resistance instead of being an indication of a predisposition to reactivation of infection.

Table II presents the salient features of cases in which we felt the diagnosis clinically justified. It will be seen that the majority have very little or no sputum, and that from only one was the

TABLE II (Continued)

Sputum Smears & Cultures TB & Coccid.	Coccid. 1-1000 Skin Test	1 Mgm. TB Test Mantoux	Treatment	Results
Negative	4 cm.	Neg.	Pneumothorax, 6 mos. No improvement. Cavity closed 3 mos. after stopping pn.	Out of school 1 month.
Negative	3 cm.	Neg.	Pn. 10 months. Modified rest.	Cavity closed. Well.
	4 cm.	Neg.	Normal life.	Well.
Negative	4 cm.	1 cm.	Modified rest.	Clinically well.
Negative	2 cm.		Rest.	Well.
Positive Coccid.	4 cm.	Neg.	Rest.	Well.
Negative	2 cm.	Neg.	Pn. 3 yrs. Diagnosis not made at onset.	Cavity closed. Well.
Monilia Negative	2 cm.	Neg.	Rest.	Well.
No sputum	1 cm.		Rest.	Well.
None	3 cm.	Neg.	Rest.	Well.
None	4 cm.	Neg.	Rest.	Well.

organism cultured. In all cases the coccidioidin test was positive and it happened that practically all had negative tuberculin tests in spite of chest lesions shown by x-ray. Case 5 had no x-ray lesion and the diagnosis rested upon the short residence in Arizona, the occurrence of symptoms of an acute respiratory infection and the occurrence of erythema nodosum and a positive coccidioidin skin test. Four had erythema nodosum, four showed eosinophilia.

The following two cases of coccidioidal granuloma were seen:

Case 12: H. H., age 63. *Chief Complaint:* Loss of weight, twenty-seven pounds in the last eight weeks. *Present Illness:* Began in December 1945. He complained of slight cough which had been present many years and he thought it was due to smoking but since Christmas he had coughed more and raised sputum several times a day. He was first seen February 7, 1946. He had no pain in the chest and no hemoptysis. He had noticed some increasing dyspnea, slight hoarseness of the voice at times, but no loss of voice and no fever. There was increasingly poor endurance and lack of appetite.

Physical Examination: The general condition was poor, temperature 98.6, height 70 inches, weight 153 pounds. The cervical glands were palpable but not enlarged. No axillary glands were felt. The heart sounds were clear, the blood pressure 124/75. Examination of the chest revealed a few fine rales over the upper right anteriorly. There was an operative scar on the abdomen and a feeling in the upper quadrant of some increased resistance. The x-ray revealed a dense opacity occupying the upper third of the right lung, the lower margin of which was sharp and coincided with the lower border of the upper lobe. Only a small portion of upper lobe contained air, the upper border of the lesion being irregular. The density broadened toward the hilus. Three direct sputum examinations were negative for tubercle bacilli and fungi. Fluoroscopic examination showed the cloudy shadow as seen on the x-ray to be anterior. Several consultants agreed on a diagnosis of carcinoma of the lung. Exploratory thoracotomy revealed a tumor mass in the right upper lobe and the pathologist and surgeons were convinced by the gross appearance that carcinoma of the lung was the probable diagnosis. The lung was removed. The patient died on the third post-operative day with pulmonary edema and microscopic section demonstrated typical spherules of coccidioidomycosis. *Diagnosis:* coccidioidal granuloma.

*Case 13:** T.A. is a case of coccidioidal granuloma of the nose, causing enormous swelling extending over the face, the lower eyelids and upper lip, and with lesions extending through the soft palate. In December 1943, this patient was treated for erythema multiforme with recovery. In September 1944 the tip of the nose became swollen and reddened. The size of the swelling gradually increased over a period of months and satellite lesions developed on the alae and on the soft palate. Biopsy taken in February 1945 showed coccidioidal granuloma. Large doses of potassium iodide were administered with indifferent results. There was no definite improvement with deep x-ray therapy. Exacerbation and remission, but chronic marked redness and swelling of the nose had been

*Case presented by courtesy of Louis Jekel, M.D.

the course. In April 1946 *coccidioides* mycosis was cultured from the nose by Dr. Charles Smith and serological tests were positive. Vaccine therapy is now being instituted.

DISCUSSION

While infection is prevalent and common, clinically significant illness is rather uncommon and severe illness is relatively rare. One proven fatal case has come to our attention in addition to the one presented. Even persistent pulmonary lesions demonstrable on x-ray as infiltration shadows, cavitation or nodular lesions are rather infrequent, considering the whole group of those infected. While the disease is a generalized infection, the outstanding symptoms of the clinical picture may center around pulmonary infection, but the extent to which gastro-intestinal infection may occur is not known. Whether many individuals become sensitized through the gastrointestinal tract is undetermined. It is known that in all cases where positive sputum cultures are obtained and in most cases where erythema nodosum is present the skin test is positive, but whether mild infection with the fungus always produces a positive skin test is not known. We believe that the skin test once positive, stays positive for many years but we do not know whether it is permanently positive. It seems probable that one infection producing a positive skin test reflects acquired resistance but whether subsequent infections may occur has not been determined. It is now found that most cases of erythema nodosum occurring in this vicinity are due to coccidioidomycosis and the fact that this manifestation is rather uncommon here is one of the best indications of the relative infrequency of the clinical disease.

CONCLUSIONS

1. Data are presented to show that over half of the school population of the Phoenix area is sensitive to coccidioidin. Therefore, infection must usually take place in childhood.
2. A series of cases of clinical infection is presented in table form. The incidence is extremely low considering the number of sensitized individuals.
3. Infection is usually mild and self-limited. Relatively few cases can be proved beyond question. Serious disabling disease from the infection is extremely rare.
4. Two fatal cases have been reported in Phoenix, one of which is presented.
5. Most diagnoses of coccidioidomycosis infection must be presumptive rather than absolute as the period of sputum production is usually short and sputum cultures are required.

CONCLUSIONES

1. Se presentan datos que demuestran que más de la mitad de la población escolar de la región de Phoenix es sensible a la coccidioidina. Por consiguiente, la infección generalmente debe ocurrir en la niñez.

2. Se presenta en forma tabular una serie de casos de infección clínica. La frecuencia es extremadamente baja si se considera el número de individuos sensibilizados.

3. La enfermedad suele ser leve y de limitada duración. Relativamente pocos casos pueden ser definitivamente comprobados. Es raro en extremo que esta infección cause enfermedad grave que incapacite al enfermo.

4. Se presenta uno de los dos casos fatales acerca de los cuales se han publicado informes en Phoenix.

5. La mayor parte de los diagnósticos de infección coccidioidomycosa deben ser presuntivos más bien que absolutos, pues se requieren cultivos del esputo, y el periodo de producción de esputo es generalmente corto.

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1005 Professional Building.

Closed Intrapleural Pneumonolysis

C. G. BAYLISS, M.D.

Sydney, Australia

INTRODUCTION

In 1882, Forlanini¹² of Milan proposed the induction of artificial pneumothorax in patients suffering from pulmonary tuberculosis, and in 1894¹³ he published his experience with the first patients to be submitted to this form of therapy. In 1885 Cayley had reported the case of a tuberculous patient in whom he had induced pneumothorax by open incision of the chest wall to control hemoptysis, and in 1888 Potain, who used a manometer to measure the intrapleural pressure, published work on air replacement in tuberculous patients who had suffered spontaneous hydro-pneumothorax. Forlanini, however, was the first to induce pneumothorax with the objective of controlling the tuberculous process in the diseased lung itself. Following Forlanini, the next significant advance in artificial pneumothorax therapy was due to J. B. Murphy of Chicago, who in 1898 urged the use of radiology to control the degree of collapse. With the routine use of the manometer by Saugman in 1904, the technique of artificial pneumothorax was placed on a sound basis, and by about 1910 this procedure had begun to take its place as an established form of therapy in pulmonary tuberculosis.

Early in the history of artificial pneumothorax the significance of pleural adhesions in preventing effective collapse was recognized, and in 1894 Forlanini¹³ wrote that "the pleural adhesions limit the volume of the pneumothorax and therefore its curative value." Matson,¹⁹ from an experience of 1,500 patients suffering from pulmonary tuberculosis treated by artificial pneumothorax, found that 40 per cent of failures were due to pleuritic adhesions which prevented satisfactory collapse. Alexander² states that diffuse adhesions prevent induction in about 20 per cent of attempts at artificial pneumothorax, and that in approximately 42 per cent to 50 per cent of cases adhesions allow only partial pneumothorax, insufficient to bring about complete healing of the lesion.

It was inevitable, then, that attempts to devise methods of freeing adhesions should be made, and in 1908 Freidrich of Marburg divided adhesions through an incision made into the pleural cavity; this operation, known as open intrapleural pneumonolysis, continued to be practised for a number of years, but owing to the

high incidence of serious complications, "died," as Newton²¹ has put it in discussing this procedure, "a natural and deserved death."

In 1913, Hans Jacobaeus of Stockholm devised the operation of closed intrapleural pneumonolysis. In the Jacobaeus operation, two cannulae are introduced into the pleural cavity through suitable intercostal spaces. The adhesion to be freed is visualized by means of a thoracoscope passed through one cannula, and division of the adhesion is effected by a galvano-cautery passed through the other. In 1915 Jacobaeus¹⁶ published a report of his first series of patients submitted to this operation. In 1922 Unverricht published a paper on thoracoscopy; writing in 1937, Alexander² was of the opinion that Unverricht had had a wider experience of this operation than anybody. In 1934 Moore²⁰ published a series of 2,043 cases collected from the reports of 41 surgeons. Among those who have reported series of cases since 1934 are Chandler^{7,8} (1937), Anderson and Alexander¹ (1937), Brock⁵ (1938), Drash¹⁰ (1938), Edwards and Lynn¹¹ (1939), Newton²¹ (1940), Thompson and Greenberg²³ (1941), Carp and Kornblith⁶ (1942), and Goorwitch¹⁴ (1943), who reported the results of 413 operations performed by four surgeons on 365 patients. In 1944 Goorwitch¹⁵ published the results of pneumonolysis in 5,114 patients collected from series reported in the literature since the publication of Moore's collected series.

STRUCTURE OF ADHESIONS

As seen through the thoracoscope, adhesions display a wide variety of forms, ranging from thin cords and narrow bands to wide, thick membranes of a complexity almost impossible to describe, and to areas where the lung is densely adherent to the chest wall over a wide extent.

Brock⁵ has discussed the formation of adhesions. Normally, external to the parietal pleura is a thin layer of loose areolar tissue containing a few tiny blood vessels and nerves. As a result of chronic inflammation involving the pleura and extrapleural tissues, this layer becomes thickened and well defined. On the degree to which this layer and the parietal pleura retain their capacity to stretch depends the structure of adhesions as found in artificial pneumothorax. In early disease involving the pleura, before the development of fibrous tissue, upon the induction of pneumothorax these layers stretch and form the greater part of the adhesion. It is in this type of case that are seen the simpler bands and cords. As the inflammatory process becomes more chronic in character, with resulting formation of fibrous tissue, the capacity to stretch of the parietal pleura and extrapleural tissues becomes less, until finally the two layers of the pleura, together with the extrapleural tissues, become welded into a

dense layer in which no capacity to stretch remains. In such a case, when pneumothorax is induced the portion of the lung subjacent to the affected area remains firmly attached to the ribs and intercostal muscles. Between the early case, in which the parietal pleura and extrapleural tissues retain their full capacity to stretch, and the long-standing case, in which this is entirely lost, every intermediate stage is found. Several stages may be found in the one adhesion. Examination of the parietal attachment of an adhesion may reveal a central portion where the lung is densely adherent to the parietes; immediately adjacent to this the parietal pleura and extrapleural tissues may have stretched to a limited degree, while the free edge of the adhesion may be formed of stretched parietal pleura and extrapleural tissues, in which no lung tissue is present.

It will be seen that many "adhesions," as seen in skiagrams in cases of artificial pneumothorax, are in reality portions of lung attached firmly to the chest wall. A type of "adhesion" seen fairly commonly is that in which a portion of lung, perhaps containing a cavity, is drawn out into the shape of a cone, tapering to a narrow attachment to the chest wall; in this type a prolongation of a cavity may extend almost to the chest wall. In some cases a portion of lung is drawn out to form a tongue-shaped mass, which is attached to the chest wall along a margin which may be several inches in extent. From the mode of formation of pleural adhesions it can be appreciated that, except in the case of thin bands, cords and membranes, which can be satisfactorily transilluminated, the danger of cutting into lung tissue during the freeing of adhesions must constantly be guarded against. Except in the case of the simple adhesions just mentioned, enucleation of the adhesions from the chest wall should be performed, the line of separation being external to the parietal pleura. The term "cutting" adhesions conveys a wrong impression of the technique which should in most cases be followed. I prefer to use the term "free" or "release" rather than "cut."

TECHNIQUE

The original two-cannula technique, introduced by Jacobaeus, in which the galvano-cautery is employed, is probably still that most widely practised. However, during recent years there has been a number of advocates for the use of the high-frequency current, or electrosurgery, as it is usually termed by American writers. Advantages claimed for electrosurgery are as follows:

1. The amount of tissue destruction on either side of the point of division of the adhesion is less than when the galvano-cautery is employed; when the latter technique is used it is held that

because of the greater tissue destruction there is the possibility of bleeding from vessels incompletely coagulated, and, later, of the separation of areas of necrosis, which have not become organized, with consequent risk of spontaneous pneumothorax.

2. When electrosurgery is used, less heat is produced within the pleural cavity.

3. The duration of the operation is shortened by electrosurgery.

4. No smoke is produced when electrosurgery is used.

Matson, who used the galvano-cautery in his earlier cases, later abandoned it in favor of electrosurgery and attributed the greater freedom from complications in his later cases to this change. Electrosurgery was used by Chandler, and is used by Moore, Drash, Newton, Cutler and others.

Supporters of the galvano-cautery emphasize the following points: 1) the simplicity and relative cheapness of the equipment; 2) the greater difficulty of perfecting the operative technique when electrosurgery is used; 3) the liability to muscular spasms when electrosurgery is used, particularly in the case of adhesions situated at the extreme apex. Advocates of the galvano-cautery include Brock and Alexander, both surgeons having had experience of electrosurgery. Alexander² notes that Jacobaeus and Unverricht, both of whom used the galvano-cautery in their earlier cases, for a time employed electrosurgery but reverted to the use of the galvano-cautery.

I have used the galvano-cautery in 251 operations at which some degree of pneumonolysis was performed; in no case did there occur hemorrhage which could be attributed to the cause suggested above. In one or two of my cases it is possible that separation of an incompletely organized area of necrosis was a factor in the occurrence of spontaneous pneumothorax; nevertheless if there is a proper understanding of the technique of employing the galvano-cautery in freeing pleural adhesions, the incidence of hemorrhage and spontaneous pneumothorax should, I believe, be no greater with this method than when electrosurgery is used. More heat may be produced within the pleural cavity when the galvano-cautery is used, but I have seen no complication which I can attribute to this cause. Smoke sometimes occurs when the galvano-cautery is used, but, although occasionally a mild annoyance, has not in my experience occasioned any real difficulty.

A single cannula technique has been used by some surgeons. Electrosurgery is used, and both thoracoscope and high-frequency electrodes are introduced through a single cannula. This technique was used by Chandler and has been used in America by O'Brien, Cutler and others. In my view the ability to introduce the telescope

through a separate cannula confers on the surgeon advantages which enormously outweigh the disadvantage, which indeed is minor only, of making two punctures instead of one. The field of vision is greater, and during the operation the telescope may be moved at will without altering the position of the cutting point of the cautery; because of this facility the adhesion which is being freed may be viewed from a different angle, or perhaps a vital structure such as the subclavian artery, lying immediately outside the field of vision, may be re-examined and its position in relation to the adhesion reassessed. A very important advantage of employing separate cannulae for the introduction of the telescope and the cautery is that the surgeon is able to transpose the instruments at any stage during the operation, introducing the telescope through the cannula originally used for the cautery and *vice versa*. Frequently by changing the positions of the instruments in this manner a better approach is obtained for the completion of the operation. Also, at the commencement of an operation it is my routine procedure to inspect the pleural cavity with the telescope introduced through each cannula in turn. I have found that the added information given by examining the pleural cavity from the second position has been very valuable indeed in assessing the adhesions to be freed. I feel that the inability to do this may deprive the surgeon of information necessary for a complete assessment to be made. It is my opinion that by the employment of the two-cannulae technique adhesions may be freed which it would not be possible to attempt working through a single cannula.

A further point with regard to the use of a single cannula is that, of necessity, the latter must be of large calibre; this may be a cause of difficulty in the case of patients possessing narrow intercostal spaces.

All-important in the operation of pneumonolysis is the question of illumination. It cannot be stressed too greatly that unless the illumination is adequate even an operation which would normally present little difficulty may be rendered dangerous. Various types of telescope have been used. I have found a telescope employing right-angled vision satisfactory for the majority of adhesions; however, in the case of some adhesions situated in the extreme apex of the thoracic vault it is very difficult to manipulate the telescope so that the mirror of the instrument is sufficiently close to the parietal attachment to obtain adequate illumination. For adhesions of this type a telescope employing a more direct type of vision such as the "Forobloque"* type is much more readily manipulated into position.

*Made by the American Cystoscope Manufacturers, Inc.

As regards the operation itself there are several points that may be stressed. The first essential is that the adhesion to be freed must be thoroughly examined, its limits defined, and its relation to vital structures determined; the limits of lung tissue in relation to the adhesion must be decided beyond doubt. The next point is the heat of the cautery tip. This should never be greater than that which will produce a dull red glow. When the cautery is too hot tissue is seared through, blood vessels are not coagulated, and hemorrhage is likely to occur. During the actual cauterization the tip of the cautery must always be in full view of the surgeon; failure to observe this rule may result in haemorrhage difficult to control, because the bleeding point is not clearly seen. Blunt dissection may frequently be employed; with the current off, the cautery tip is used as a dissector, the plane of dissection being external to the parietal pleura. Finally it must be stressed that closed intrapleural pneumonolysis is an operation in which meticulous care must be exercised from the commencement of the operation to the end: relaxation of vigilance for even a few seconds may easily result in irremediable disaster.

Anaesthesia: In my series, local anaesthesia has been used except in the case of two patients. Preliminary premedication is employed, and after several methods had been tried the most satisfactory was considered to be a combination of "Nembutal" and "Omnopon." "Nembutal" (three grains) is given two hours before operation and "Omnopon" (two-thirds of a grain) one hour before. Anaesthesia is effected by infiltration of the tissues, through which the trocar is to be introduced. "Planocaine" (0.5 per cent), to which are added three minims of adrenaline solution for each ounce of anaesthetic solution, is used. Frequently four ounces, and on occasion six ounces, of this solution have been used for a single patient. No untoward effects have been observed. The average amount required for each patient is about three ounces of solution. When necessary the parietal insertion of the adhesion itself may be infiltrated by means of a long needle introduced through one cannula. In the great majority of patients infiltration of the adhesion is unnecessary, and I prefer to avoid it. The needle may puncture a small vessel and troublesome oozing may follow; in addition, when the parietal end of the adhesion is infiltrated with anaesthetic solution I have found that cauterization is rendered appreciably more difficult.

In the case of one patient, who begged to be rendered unconscious, "Avertin" was used but was not satisfactory, because, although unconscious, she became restless as soon as the parietal pleura was touched with the cautery. In this case the operation had to be abandoned.

In the case of another patient, a rather nervous girl aged fifteen years, gas and oxygen anaesthesia was employed. This operation was completed satisfactorily, but was rendered difficult because of the large respiratory excursions.

Site of Punctures: Various sites have been recommended as the most suitable for introduction of the cannulae. Alexander² recommends that, as the majority of adhesions are in the postero-lateral portion of the chest, the thoroscope should be introduced through the anterior or antero-lateral thoracic wall and the cautery through the mid-axillary or postero-lateral thoracic wall. Brock,⁵ on the other hand, states that he has never to his memory used an anterior puncture, and he finds the thought distasteful. Brock introduces the thoroscope posterior to the angle of the scapula in the sixth or seventh intercostal space. Alexander, again, states that on the few occasions on which he has chosen the posterior position as used by Brock it has given a relatively unsatisfactory view of postero-lateral adhesions, and that the narrowness of the posterior intercostal spaces has interfered with free and painless movement of the instrument.

I have tried a variety of puncture sites. Although formerly I³ have expressed the view that the anterior and posterior axillary lines are the most suitable, I am now of the opinion that the sites recommended by Brock are to be preferred for most patients. I now always make the first puncture in the mid-axillary region and inspect the pleural cavity from this position. With the telescope still in position, I introduce the anaesthetic needle through the site projected for the introduction of the second cannula; I then visualize the point of the needle and assess the suitability of the site, and if for any reason it is considered unsatisfactory, another position is then readily chosen. Not very infrequently when there are present adhesions between the lung and the posterior region of the thoracic wall a trocar introduced posterior to the angle of the scapula will strike such an adhesion, and may even puncture the lung itself; for this reason usually it is not advisable to make the first puncture in this area. Although it is possible to strike an adhesion when introducing the trocar through the mid-axillary region, in my experience the likelihood of doing so is very much less in this area than it is in the posterior region of the thorax. With the patient lying on the side, in the usual position for operation with the side to be operated upon uppermost, there is a greater distance between lung and chest wall in the mid-axillary region than there is posteriorly; consequently the risk of puncturing the lung is much less in the mid-axillary region than it is posteriorly. Apart from the possibility just discussed of striking an adhesion when introducing the trocar pos-

terior to the angle of the scapula, in the case of an adhesion situated posteriorly in the extreme apex of the pleural cavity, I have occasionally found this site unsuitable because of the difficulty of tilting the cannula introduced through it to a sufficiently acute angle to enable the instrument passing through it to be brought into a suitable position in relation to the parietal end of the adhesion. In such a case the second cannula must be introduced through the postero-lateral region of the thorax.

A manoeuvre which I have frequently employed with success, particularly in the case of an adhesion situated dangerously close to vital structure such as the subclavian artery, is the introduction of a third cannula. Through this cannula is passed a retractor. The retractor is placed in position so that the adhesion is lifted away from the vessel, or in some cases so that the lung is retracted to give a better approach to the adhesion. The assistant then takes the retractor. The disadvantage of this manoeuvre is the number of instruments crowded together in a relatively restricted area; in addition the assistant must hold the retractor blindly, being unable to see what she is doing. Nevertheless by employing a third cannula I have, in an appreciable number of patients, been enabled to complete the freeing of adhesions which otherwise I could not have attempted.

I do not think that painstaking attempts to map out the adhesions prior to operation, with the object of planning precise puncture sites accordingly, are repaid. Frequently the adhesions prove, on thoracoscopic examination, to be very different from the preoperative conception, and often adhesions unsuspected prior to operation are found.

INDICATIONS FOR OPERATION

Although occasionally one sees patients in whom artificial pneumothorax, prevented by adhesions from effecting complete relaxation of the lung, is followed by closure of cavities, and even by healing of the lesion in the great majority of such cases, the disease remains uncontrolled. Cavities not infrequently become smaller in the presence of incomplete pneumothorax, but rarely do they close completely, and so long as a residual cavity persists, there remains to the patient the potential danger of bronchogenic spread of the disease. Rich,²² in discussing the bronchogenic spread of tuberculosis, wrote as follows:

The site of origin is ordinarily a cavity, and it may even be quite a small one. It is not infrequently necessary to search the lungs carefully, by making thin sections with a sharp knife, in order to find a small cavity, that may be only half a centimetre in diameter, from which the bacilli responsible for small foci of tuberculous pneumonia in other portions of the lung were discharged.

Whilst all pleural adhesions do not necessarily prevent effective collapse, particularly in the case of basal adhesions, nevertheless any adhesions over the site of a lesion must be prejudicial to healing. Even when no cavity is obvious the continual tugging with each respiration over an area of active exudation is likely to prevent healing and even to cause spread of the process.

Brock,⁵ writing in 1938, made the following statement:

Most experienced workers now agree that even though cavities do not appear to be present in the lung that is held by adhesions, and although symptoms are absent or minimal, it is not safe to leave such a lung incompletely collapsed, if study of the earlier films shows that the adhesions are controlling areas of what was active disease.

A further aspect of the incomplete pneumothorax is the question of complications. There is general agreement that the more serious complications of artificial pneumothorax therapy, namely spontaneous pneumothorax, persistent effusion, empyema and obliterative pleuritis, are much more common in those patients in whom the pneumothorax is complicated by adhesions than when a technically satisfactory collapse is present.

I have been interested to compare the results in my earlier cases of artificial pneumothorax with those in the more recent group, in which practically all patients with adhesions have been given the opportunity of having thoracoscopic examination, and when possible, pneumonolysis. Both from the point of view of absence of complications and from that of control of the pulmonary lesion, the results in the latter group are much the better; this, of course, has been noted by numerous observers in Europe and America. However, it strengthens me in the view that rarely should thoracoscopy be withheld from the patient in whose case an artificial pneumothorax, worth continuing at all, is rendered ineffective by adhesions.

SUITABILITY FOR OPERATION

Alexander² gives as his experience that relatively few patients having artificial pneumothorax therapy have adhesions suitable for pneumonolysis, and he holds the view that less than 25 per cent of patients having this form of collapse therapy should be submitted to operation. Edwards and Lynn¹¹ are of the opinion that with the aid of pneumonolysis complete collapse can be obtained in over 30 per cent of all cases of artificial pneumothorax. I believe that Alexander is unduly conservative in his view that less than 25 per cent of patients having artificial pneumothorax therapy are suitable for pneumonolysis.

The decision regarding suitability of any individual patient for

operation rests primarily on the skiagram. In a few cases the film indicates extensive pleural symphysis, which would obviously render impossible any attempt at pneumonolysis. In a few patients also the presence of simple cords and bands may be deduced with reasonable certainty. In the great majority of patients the nature and extent of adhesions cannot be determined from the skiagram alone, although usually it is possible to form a reasonably accurate estimate of their general complexity and to reach a conclusion as to whether operation is likely to be difficult. In my experience, in the case of patients about whom prior to operation I have formed the opinion that it was unlikely that pneumonolysis could be carried out, I have seldom been mistaken; on the other hand I have not infrequently found that in the case of patients in whom I had hoped to perform a complete operation, either pneumonolysis could not be done or could be performed only in part.

Fluoroscopic examination is a valuable aid in the assessment of adhesions, and in the case of a few patients oblique films have helped me considerably.

Some authors believe that considerable value attaches to stereoscopic films. Newton²¹ expressed the view that stereoscopic films are obligatory, but later admits that too much dependence cannot be placed on them and that the final decision as to operability can be made only after thoracoscopic examination. Brock⁵ has used stereoscopic films rarely, and "only when they have been supplied." Alexander,² although advising stereoscopic films, believes that the final decision regarding operation rests on the result of the fluoroscopic examination. With the view that in the great majority of cases the decision to undertake pneumonolysis can be made only after visualization of the adhesions through the thoracoscope I am in agreement.

At operation it is not infrequently found that what may appear on the skiagram as a simple cord is the edge of a broad membrane. Three cords as seen on the skiagram may prove to be the three edges of an adhesion which is T-shaped on cross section. An otherwise simple adhesion may be found at operation to be attached to a vital structure, as a consequence of which operation is rendered impossible. In my series, in an appreciable number of patients having adhesions attached to the extreme apex of the thoracic vault the parietal attachment of the adhesion has been either in close proximity to or directly over the subclavian artery. By using a third cannula as described above, I have been able to free a proportion of these adhesions, but there have remained a number of patients in whom I have considered that any attempt at pneumonolysis would have been far too hazardous. Frequently adhesions are found whose presence was not suspected prior to

operation. One type of adhesion which should be left untouched when found is the broad membrane holding up a large peripheral cavity. In this type of adhesion the peripheral wall of the cavity probably receives the greater portion of its blood supply through the adhesion. To sever the adhesion is likely to lead to sloughing of the cavity wall, with consequent development of spontaneous pneumothorax.

The decision whether to operate in patients in whom extensive adhesions are present sometimes requires the exercise of considerable judgment. A situation not uncommonly met is where the apex of the lung is held up by an extensive adhesion, frequently highly complex in form and arrangement. Examination of such an adhesion may reveal that it would be possible to free the adhesion in a large part of its extent, but that complete freeing could not for technical reasons be achieved. I have carried out partial pneumonolysis in a number of such cases, and have in some of them obtained an excellent result. Nevertheless, I am somewhat averse to undertaking partial pneumonolysis of this type. I feel that there is the risk that the unfreed portion of the adhesion may tear further, with the possibility that spontaneous pneumothorax may result, particularly in the case of apical adhesions situated posteriorly, I do not like leaving an adhesion partly freed; in several cases in which I have done this with the intention of completing pneumonolysis at a further session, at the subsequent operation the lung has been found to have become densely adherent to the chest wall, precluding any further attempt at freeing the lung.

Assessment of adhesions through the thoroscope may reveal that there is a number of simple adhesions which could readily be freed, but that the main adhesion present could not be freed. Freeing of adhesions which cannot result in any benefit to the patient is merely meddlesome, and is to be strongly deprecated.

DURATION OF PNEUMOTHORAX BEFORE OPERATION

It has been advised in the past that a sufficient period should be allowed for the adhesions to stretch before pneumonolysis is attempted. Alexander² has stated that pneumonolysis should not be undertaken in the average patient until three to six months after the induction of pneumothorax. However, it is to be remembered that with the passage of time fibrous tissue formation takes place in the adhesion, which becomes shorter, tougher and broader; as a consequence of this, operation is rendered more difficult. Further, if pneumonolysis is delayed for several months there is the risk that complications such as spontaneous pneumothorax may occur during the period of waiting. The attempt to

stretch adhesions by the use of positive pressure is highly dangerous, and cannot be condemned too strongly; tearing of the adhesion at the visceral end may occur, with consequent development of spontaneous pneumothorax. Finally, if operation is deferred unnecessarily, time is being wasted, since in the estimation of the period in which pneumothorax should be continued in any patient the date at which the pneumothorax is rendered effective must be considered as the date of commencement.

Newton²¹ advises operation as soon as the maximum collapse obtainable without the use of high pressures has been reached, provided that a sufficient space exists and the adhesions seem operable. Thompson and Greenberg advocate operation about three weeks after induction of pneumothorax. My own view is that operation should be undertaken as soon as an adequate space is present in which to work. In one patient I performed satisfactory pneumonolysis thirteen days following induction of pneumothorax; I have frequently operated fourteen days following induction of pneumothorax, and in the majority of patients there is little reason to delay operation beyond this period. In the case of patients with the more complex type of adhesions a rather longer waiting period is sometimes necessary to gain an adequate space in which to work, but as stressed above, forcing by positive pressure should never be resorted to.

THE PRESENT SERIES

Clinical Material

The clinical material on which this study is based is set out in the following scheme:

Total number of thoracoscopic examinations (including more than one operation on the same patient and operations at which thoracoscopic examination only was performed)	311
Number of individual pleural cavities inspected	268
Number of patients to have both pleural cavities inspected	17
Number of persons to have thoracoscopic examination of one or both pleural cavities	251
Number of lungs upon which pneumonolysis, complete or incomplete, was performed	225
Number of patients to have pneumonolysis performed on both lungs	15
Number of persons to have pneumonolysis performed on one or both lungs	210
Total number of operations at which some stage of pneumonolysis was carried out	251

In the case of one pleural cavity four thoracoscopic examinations were carried out.

In the case of four pleural cavities three thoracoscopic examinations were carried out.

In the case of 32 pleural cavities two thoracoscopic examinations were carried out.

In the case of 231 pleural cavities one thoracoscopic examination was carried out.

Complete pneumonolysis was performed in the case of 123 lungs. Incomplete pneumonolysis was performed in the case of 102 lungs. Pneumonolysis was not attempted in the case of 43 lungs. By complete pneumonolysis is meant that all adhesions preventing effective collapse of the lung were freed. By incomplete pneumonolysis is meant that in the case of multiple adhesions some, but not all, of the restraining adhesions were freed, or in the case of a single large adhesion, that a significant portion was freed.

The results in the first 115 patients in whom thoracoscopic examination was carried out have already been published.³ Of the 311 operations, 229 were performed at the Canterbury District Hospital and 82 at the Royal North Shore Hospital.

In Table I are shown figures which indicate, in the case of a few representative published series, the proportion of patients submitted to thoracoscopic examination in whom pneumonolysis, complete or incomplete, was carried out.

TABLE I

Author	Total Number of Patients	Complete Pneumonolysis	Incomplete Pneumonolysis	Pneumonolysis Not Attempted
		<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
Anderson and Alexander	111	41 (37.0)	46 (41.4)	24 (21.6)
Edwards and Lynn	255	86 (34.0)	140 (55.0)	29 (11.0)
Carp and Kornblith	100	32 (32.0)	43 (43.0)	25 (25.0)
Matson	249	154 (61.9)	19 (7.6)	76* (30.5)
Brock	361	—	—	59 (16.3)

*With regard to these 76 patients reported in Matson's paper, the following comment is made by the author: "This group comprised cases unsuitable for operation. In most cases minor adhesions of no technical importance were severed."

Goorwitch found that of the 5,114 patients in his collected series who had pneumonolysis performed, in 52 per cent the operation was complete and in 48 per cent it was incomplete.

Of the 102 lungs upon which incomplete pneumonolysis was carried out, satisfactory relaxation followed in 44 cases. This result indicates the importance of freeing all adhesions preventing relaxation of the lung whenever possible; on the other hand, that

of 102 cases in which incomplete pneumonolysis was carried out satisfactory relaxation of the lung followed in 44 shows that the incomplete operation may not infrequently result in a satisfactory pneumothorax being obtained.

TYPE OF ADHESIONS

The patients in my series are not a selected group, and include a large number who have had advanced disease. The largest single group in the series comprises patients referred from a sanatorium to which patients with early disease ordinarily are not sent. Indeed in studying the history and original skiagrams of patients upon whom I have performed thoracoscopy I have been impressed by the late stage at which so many have come under treatment. In the majority of patients this has seemed to be because of the late stage at which patients themselves have felt the need to seek medical advice. It seems that if patients are to come under treatment when the disease is at an early stage a State-wide scheme involving the use of photofluorography will be necessary. Several of the patients in my series came under treatment following investigations consequent on the finding of suspicious signs on routine photofluorographic examination of the chest at the time of enlistment in one or other of the services; a few women are included in this group.

I have arbitrarily divided the adhesions seen into four grades, according to their number and complexity, as follows: grade I, not extensive (for example, one or two simple cords or narrow bands, or one rather wider band); grade II, moderately extensive (for example, two or three bands about one inch wide, or one fairly wide band; in one of my cases there were present one thick adhesion about one and a half to two inches wide, one narrow band and one short membrane about one inch wide); grade III, extensive (for example, in one of my cases, ten bands of varying widths, thicknesses and lengths were present); grade IV, very extensive (in most of these patients pleural symphysis was present over wide areas, and in most pneumonolysis was not attempted, although in a few cases partial freeing of the lung was possible.

In accordance with this classification, in 32 cases adhesions classed as grade I were present; in 65 cases adhesions classed as grade II were present; in 110 cases adhesions classed as grade III were present; and in 58 cases adhesions classed as grade IV were present. In the case of three patients in whom the presence of adhesions was suggested by the appearance of the lung contours on the skiagram, no adhesions were found on thoracoscopic examination.

CONTRALATERAL DISEASE

Of the 251 patients upon whom thoracoscopic examination was carried out, bilateral disease was present in 143 cases. Pneumonolysis was carried out on 225 lungs; in 32 cases contralateral pneumothorax was being maintained at the time of operation. In addition, contralateral artificial pneumothorax was being maintained in the case of four patients in whom thoracoscopic examination only was carried out.

DURATION OF PNEUMOTHORAX PRIOR TO OPERATION

The shortest period from the time of induction of pneumothorax to the time of operation was thirteen days, and the longest three years. In 110 cases pneumothorax had been present for less than three months, in 83 cases from three to six months, in 60 cases from six to twelve months, in 11 cases from twelve to eighteen months, in one case from eighteen to twenty-four months, and in three cases over two years.

AGE OF PATIENTS

The youngest patient in the series was fifteen years old and the oldest was aged forty-eight years. Chandler,⁷ in his series, records that he operated upon a child aged seven years; the same author notes that he also operated upon a patient aged fifty-four years.

FINAL ASSESSMENT

Goorwitch,¹⁵ in discussing the results of pneumonolysis, expresses the view that any beneficial results occurring in patients who have had pneumonolysis performed must be attributed to the artificial pneumothorax, which is merely rendered more effective by the operation. This is, of course, true; nevertheless I believe that it is not unprofitable to attempt to determine those patients in whom, without operation, pneumothorax would not have succeeded in controlling the diseased process but in whom, following pneumonolysis, a more effective collapse has been enabled to do so. The criteria of a successful operation are the subsequent closure of cavities, the inability to recover tubercle bacilli from the patient by modern methods of investigation, such as culture of the fasting gastric contents, and the absence of complications which have caused any permanent detriment to the patient. In any given patient, to decide whether artificial pneumothorax, which has been successful following pneumonolysis, would not have been successful if no operation had been performed is often very difficult, and maybe impossible. Nevertheless for an observer experienced in artificial pneumothorax therapy, I believe that in

the majority of cases it is possible to reach a conclusion. Consequently, in respect of this series, the attempt has been made to divide the results into successful and unsuccessful, in accordance with the ultimate benefit to the patient. In some cases, although complete relaxation of the lung was obtained cavities have not closed; in these cases, although technically the operation was a success, it was a failure from the point of view of the patient. In a few patients in whom complete relaxation of the lung was obtained serious complications have occurred. There have also been some patients in whom pneumonolysis appears to have been followed by control of the disease in the lung operated upon, but whose ultimate fate will depend on measures directed to the other lung in which uncontrolled disease is present. It seems not unreasonable to assess the result of operation in these patients as provisionally successful. Also, in the case of a few of the patients who have had bilateral pneumonolysis performed, while the operation on one lung appears to have been followed by control of the lesion in that lung, as regards the other lung the result is still in doubt or has been unsuccessful. The result of operation in the case of each lung in those patients who have been submitted to bilateral operation will be indicated.

Two hundred and ten persons had pneumonolysis performed, 15 of these having had both lungs operated upon. In the case of 111 of these patients control of the disease appears to have occurred or seems likely to occur; in the case of 13 patients the operation has been classed as provisionally successful; in the case of 57 patients the operation has been unsuccessful, and in the case of 29 patients it is considered that too short a period has elapsed for a final conclusion to be drawn. Of this last group of 29 patients, which includes six in whom bilateral pneumonolysis has been carried out, an excellent final result is confidently hoped for in at least 10 cases, but I prefer not to include these among the "successes" at this stage.

Of the 15 patients in whom bilateral pneumonolysis has been carried out operation appears to have been followed by control of the lesion in both lungs in six cases; two patients are included in the group noted above, in whom a favourable outcome is confidently hoped for; in the case of three patients, while the disease in one lung appears to be under control the outcome in the case of the other lung is still in doubt and other measures may need to be instituted. In the case of two patients too short a period has elapsed for an opinion to be given. As regards the remaining two patients, although in one of them excellent relaxation of both lungs is present, it is considered that the ultimate outlook is unsatisfactory.

Of the total of 225 lungs upon which pneumonolysis was performed, operation appears to have resulted in a pneumothorax which was effective in controlling the lesion in the lung concerned in 130 cases.

Of the 5,114 cases in Goorwitch's collected series, 73 per cent were considered to be clinically successful.

COMPLICATIONS

Complications of pneumonolysis include hemorrhage, persistent nonpurulent effusion, spontaneous pneumothorax, bronchopleural fistula, empyema and contralateral spread of the disease. A late sequel may be obliterative pleuritis. Less important complications seen include transient serous effusions, surgical emphysema, post-operative vomiting, injury to nerves and dyspnea during operation. Pleuro-cutaneous fistula may occur as a complication of empyema, forming along the needle track following aspiration; a fistula also may be the result of *empyema necessitatis*.

Hemorrhage: Hemorrhage may occur from the site of separation of the adhesion, from injury to a major vessel such as the subclavian artery, or, rarely, from injury to an intercostal artery by the trocar.

In order to lessen the risk of injury to the lung, adhesions should be divided flush with the chest wall, or preferably in the majority of cases enucleated from the chest wall. This increases the risk of injuring an intercostal vessel or one of its branches. However, with adequate experience and careful attention to technique I am firmly of the opinion that hemorrhage from this source should rarely if ever occur. In my series there were three patients who suffered severe hemorrhage. These patients were operated upon at an early stage in my experience, and over 200 consecutive operations at which pneumonolysis was actually carried out have since been performed without the occurrence of any but minor hemorrhage, which has easily been controlled.

Hemorrhage has been reported to have occurred through opening into one of the great vessels. Alexander² notes that Gullbring reported the death on the operating table of a patient whose subclavian artery had been opened into. Goorwitch¹⁵ states that he has personal knowledge of three instances of operative injury to the mediastinal vessels with a rapidly fatal outcome. Many adhesions are situated in the extreme apex of the thoracic cavity where the approach to the adhesion may be very difficult and where it is frequently necessary to apply the cautery in close proximity to the subclavian artery; however, careful appraisal of the adhesion to be freed and identification of the great vessels before commencing cauterization, and above all, unremitting care

during the operation should prevent the occurrence of this catastrophe.

Rarely, troublesome hemorrhage occurs as a result of the trocar puncture. In the case of one patient in my series steady, although not severe, hemorrhage was still present at the termination of an operation which had lasted about forty minutes. The hemorrhage appeared to come from just inside the internal opening of the puncture. It is possible that this hemorrhage would have stopped spontaneously; however, a third cannula was introduced and the cautery passed through it. The tip of the cautery was then carefully inserted into the bleeding opening and the area from which the hemorrhage appeared to be coming was coagulated. This manoeuvre was successful in stopping the hemorrhage. Goorwitch¹⁵ notes the occurrence in one of his own patients of hemorrhage the source of which he believes to have been an intercostal vein traumatized at operation by the trocar.

Blood vessels of any magnitude are seldom present in the adhesion itself. However, in one of my cases tortuous veins about one-eighth of an inch in diameter were present on the surface of a band about one inch wide. I was able to coagulate these veins and the adhesion was freed without incident. As regards the three patients mentioned above who suffered severe hemorrhage, death from blood loss did not occur in any case. One patient later developed tuberculous empyema, and this case will be fully considered in a later section. In the case of the two patients, both of whom had advanced bilateral disease, in spite of repeated aspiration the hemorrhage rapidly became loculated and later became organized, although empyema did not follow in either case. One of these two patients died two months following operation, the cause of death being the burden of an organized hemothorax added to extensive bilateral disease. The other patient lived for six months. This, in the opinion of his physician, was his expectation of life had no operation been performed.

Table II shows the incidence of hemorrhage in a number of reported series of patients. In the attempt to compare different series, not infrequently difficulty is experienced because various authors interpret incidents differently. For example, Matson,¹⁸ in one paper, refers to a hemorrhage involving the loss of two litres of blood as "moderate"; other authors might class a hemorrhage of this order as serious. Drash,¹⁰ in reporting three cases of hemorrhage in his series, noted one as "serious" and two as "moderate"; nevertheless in two of these cases open operation was necessary to control the bleeding.

At this stage, in order to avoid repetition, I will discuss the general question of recording complications. Some authors, for

example Edwards and Lynn,¹¹ have shown complications as a percentage of all operations performed, irrespective of whether pneumonolysis was performed or not or whether the total includes more than one operation on the same patient. Calculated in this manner, complications in my series would be based on a total of 311 cases. Anderson and Alexander¹ have shown complications as a percentage of the total number of patients upon whom thoracoscopic examination was carried out, inclusive of those patients in whom pneumonolysis was not done. For my series, counting each pleural cavity inspected as an individual (*vide infra*), the corresponding basis of calculation would be 268. Again, others, such as Brock,⁵ take the total number of operations at which any degree of pneumonolysis was performed. The corresponding figure in my series would be 251. Obviously such variable methods of indicating results leads to hopeless confusion when comparing the records of various authors, and some uniform basis of comparison must be decided upon.

It is true that every operation carries its own risk of complications, but as regards thoracoscopic examination in patients in whom pneumonolysis is not done I feel that the risk of subsequent

TABLE II

Author	Number of Operations	No. of Cases of Severe Hemorrhage	No. of Cases of Small Hemorrhage
		Per cent	Per cent
Anderson and Alexander	87	0	0
Brock	360	3 (0.8)	
Carp and Kornblith	75	2 (2.6)	
Drash	251	1	2 ("moderate")
Edwards and Lynn	231	1 (0.4)	6 (2.6)
Goorwitch (four surgeons)	413	12 (2.8) (1,000 cc. or more)	24 (5.8) (500 cc. or less)
Goorwitch (collected series)	5,886	(1.7)	(3.3)
Jacobaeus	600-700	2	
Matson	249*	3	
Moore (38 surgeons)	2,043	15 (0.7)	16 (0.8)
Newton	182	0	
Unverricht	950	0	
Viswanathan	50	2 (4.0)	

*See footnote to Table I.

complications attributable to the operation is so small that such complications should be shown separately from those following pneumonolysis. Again, in the case of those patients who have required more than one operation, my own feeling is that except in the case of hemorrhage complications should be estimated on the basis of the number of lungs operated upon rather than the number of operations. As regards hemorrhage, I believe it is reasonable to estimate the occurrence of hemorrhage as a percentage of the total number of operations at which pneumonolysis in any degree was carried out. In those patients in whom pneumonolysis has been performed on both lungs each lung of course presents an entirely individual problem from the point of view of complications.

To summarize my views, I believe that cases of hemorrhage should be shown relative to the total number of operations at which pneumonolysis was carried out, and that all other complications should be shown on the basis of the number of lungs upon which pneumonolysis has been carried out. As far as possible, I have endeavoured to follow this scheme in compiling the tables shown in this thesis.

In Goorwitch's collected series there are 5,114 patients, upon whom 5,886 operative stages were carried out. Except in the case of obliterative pleuritis and loss of pneumothorax space, Goorwitch has shown the incidence of complications as a percentage of the number of operative stages. Where necessary, I have modified his figures so that they are shown as percentages of the number of patients. In studying Goorwitch's statistics one is struck by the number of authors quoted in his series who have failed to record relevant data; for example, with regard to such an important complication as tuberculous empyema Goorwitch was able to collect information in the case of two-thirds of the total number of patients only, while as regards obliterative pleuritis the incidence was recorded in one-quarter of the total number of patients. I have experienced similar difficulties in studying the records of some authors.

Pleural Effusion: Alexander² is of the opinion that a small amount of serous exudate confined to the costo-phrenic sinus probably occurs in the majority of patients. Brock⁵ states that a slight amount of fluid after operation is inevitable, owing to the trauma inflicted and to oozing from the site of puncture. Smoke has been cited as a cause of serous effusion when the galvano-cautery is used. Smoke has, however, rarely been of consequence in my cases, and I believe that it is unlikely to be a causative factor in fluid formation. Fluid of the type mentioned is absorbed within a week or so, and is of no importance.

Of the 268 pleural cavities inspected, fluid in sufficient amount to be visible on the skiagram was present in 22 cases prior to operation. In two of the patients in this group a persistent non-purulent effusion developed. In one patient there occurred an effusion, moderate in amount, which was absorbed in the course of two or three weeks. In two patients empyema occurred. In the case of one patient in whom a considerable amount of fluid was present prior to operation, the effusion persisted at about the same level, and about seven months later obliterative pleuritis became evident. In the case of these six patients pneumonolysis was performed. No complication occurred in the remaining sixteen patients, in whom the fluid present prior to operation was absorbed subsequently.

In the case of two patients not included in the last group empyema was found at thoracoscopic examination; in neither of these patients was pneumonolysis attempted. In the case of 17 patients in whom fluid could not be detected on the skiagram prior to operation, non-purulent fluid classed as "much" or "persistent" developed subsequent to operation. By "much" is meant an amount sufficient, with the patient in the erect position, to show on the skiagram a "fluid level" higher than the dome of the diaphragm. By "persistent" is meant fluid which persisted for a period longer than four weeks. In at least two patients included in this group the fluid was not very great in amount and it was absorbed within two or three weeks; since the fluid seemed to be the result of a pleural reaction not severe in degree, but definite, these cases are recorded in this group. One of the patients in whom a persistent effusion occurred had been submitted to thoracoscopic examination only; the remaining sixteen patients in whom there developed an effusion classed as "much" or "persistent" had pneumonolysis, complete or incomplete, performed. Consequently, of the 225 cases in which pneumonolysis was carried out a non-purulent pleural effusion classed as "much" or "persistent" followed in 20 cases (9 per cent); this number includes those cases in which fluid was noted in the pleural cavity before operation and in which, following operation, a pleural reaction occurred.

Of the 43 patients in whom thoracoscopic examination only was performed, a pleural effusion of the type under discussion followed in one case; it is of interest, and may be of significance, that pleural tubercles were seen in the case of this patient.

The importance of the occurrence of a pleural effusion of this type in my cases rests in the fact that of the 20 patients in this group, in no fewer than 12 obliterative pleuritis developed at some period subsequently.

In 14 patients, including the two mentioned above, in whom non-purulent fluid was noted prior to operation, empyema developed at some period subsequent to operation. These patients will be discussed fully in a later section.

There then remain 173 patients in whom no fluid was noted on the skiagram prior to operation and in whom, subsequent to operation, either fluid, in amount sufficient to be visible on the skiagram, did not occur or there occurred fluid, slight in amount, which was rapidly absorbed and was not of clinical significance. If to these 173 patients are added the 16 patients in whom fluid noted prior to operation either was absorbed completely subsequent to operation or else persisted for a few weeks in an amount just visible in the costo-phrenic sinus, it is seen that of 225 cases in which pneumonolysis was carried out in 189 no pleural reaction occurred; of the 43 cases in which thorascopic examination only was made, which include the two patients in whom empyema was found but in whom no further reaction followed operation, no pleural reaction resulted in 42 cases.

In Table III an attempt is made to compare the incidence of non-purulent effusion in a few recorded series. In compiling this table difficulty has been experienced in appreciating the significance to be attached to such terms as "very small," "moderate" et cetera, as used by different authors. In this table, "number of patients" refers to the number of lungs upon which pneumonolysis was performed.

TABLE III

Author	Number of Patients	Number of Cases of Pleural Effusion	
		Transient or Very Small	Moderate, Much or Persistent
		Per cent	Per cent
Brock	302	81 (26.8)	37 (12.2)
Chandler	157	8 (5.1)	28 (18.0)
Edwards and Lynn	226	20 (8.8)	26 (11.5)
Goorwitch (four surgeons)	375	48 (12.8)	27 (7.2)
Goorwitch (collected series)	5,114	(16.0)	(10.9)
Newton	148	18 (12.0)	8 (5.4)

Empyema: Empyema following pneumonolysis may be tuberculous in origin, it may result from pyogenic infection, or mixed tuberculous and pyogenic infection may be present. Pyogenic infection, I believe, only rarely follows infection introduced into the pleural cavity at operation; when it occurs, pyogenic infection

of the pleural cavity is usually the result of spontaneous pneumothorax. Occasionally a tuberculous empyema which is being treated by repeated aspiration may become infected; with this possibility in mind it should be a *sine qua non* that all aspirations must be performed with the strictest aseptic technique. A purulent exudate may follow injury to the lung at operation, or a small area of necrosis which has failed to become organized may separate from the surface of the lung during the period immediately subsequent to operation. In one patient in whom spontaneous pneumothorax occurred three weeks following operation I believe that this was the mode of development. In some patients a persistently recurring serous effusion may gradually become purulent after many weeks.

Drash¹⁰ has discussed the development of empyema following pneumonolysis in a very valuable paper. He cites the work of Joannides,¹⁷ who was able to demonstrate the presence of very small tubercles on the surface of the pleura. These tubercles may very readily be dislodged—for example, by continually being washed by an effusion. Fibrin plaques on the pleural surface often contain tubercle bacilli. If such tubercles or plaques are present close to the insertion of an adhesion, it is not difficult to imagine that bacilli may be set free during the manipulations incident to the freeing of the adhesion. Again, tubercle bacilli may become sealed between the visceral and parietal pleura where the two layers have become fused at the site of chronic disease. If during the freeing of an adhesion this zone is opened into, bacilli may escape into the pleural cavity. It must again be stressed that in freeing an adhesion, except in the case of thin bands and cords which are formed of stretched parietal pleura and extrapleural tissues and which can be satisfactorily trans-illuminated, the plane of separation should be external to the parietal pleura. A further possible source from which bacilli may enter the pleural cavity is from lymphatics coursing through an adhesion. These lymphatics may contain tubercle bacilli. During the freeing of an adhesion these lymphatics may be torn or divided and the openings made not be sealed over; from these incompletely sealed channels bacilli may escape.

The presence of tubercles on the pleura when seen through the thoracoscope is an important danger signal to the surgeon, and considerable caution should be exercised before a decision is made to proceed with pneumonolysis in their presence. Unverricht is stated by Alexander² to have found that there is great danger of tuberculous empyema resulting if pneumonolysis is carried out when tubercles are present, even at some distance from the divided adhesion. In Anderson and Alexander's¹ series, tubercles were

present in "at least seven" of their 111 patients. In the case of two patients only was pneumonolysis performed; in one of these patients a tuberculous empyema occurred.

In the course of my inspection of 268 pleural cavities, pleural tubercles were found in 14 cases. In six cases no attempt at pneumonolysis was made. In one of these patients two weeks following operation a pleural reaction occurred, accompanied by an effusion which persisted for a number of weeks; this patient has been mentioned above in the discussion on pleural effusion. One patient had complete pneumonolysis performed by the freeing of ten adhesions of various widths and lengths; recovery was uneventful in this case. Seven patients each had a number of adhesions freed. In the case of five of these patients convalescence was uneventful. One of the other two patients, for whom six adhesions of various types were freed, had a number of tubercles arranged in the form of a rosette on the parietal pleura; in the center of this rosette was attached a thin band about half an inch wide, which was seen to pull on the parietal pleura with every respiration. As the structure of this adhesion permitted of its being divided some distance from the chest wall, it was considered that the risk of complications following division was probably not as great as that associated with the constant tugging on the parietal pleura if it were left untouched. The adhesion was consequently divided. Two weeks following operation a serous effusion occurred; this persisted for about six weeks before finally being absorbed. In the case of the remaining patient tubercles were noted at the base of two adhesions which were left untouched. Death, attributed to shock, occurred forty-eight hours after operation; this patient will be fully discussed in the section dealing with shock.

In my series empyema has occurred in 14 patients (6.2 per cent). In the case of eight of these patients tubercle bacilli were recovered from the fluid. In the case of two patients no organism was recovered from the fluid, and in these patients the empyema has been presumed to be of tuberculous origin. In the case of three patients both tubercle bacilli and pyogenic organisms were found. In the case of the remaining patient the empyema was pneumococcal in origin. Bacteriological examination of the fluid has included examination by direct smear and attempted culture both for tubercle bacilli and pyogenic organisms. The periods following operation at which empyema has been noted have been as follows: two weeks, three patients; three weeks, three patients; four weeks, two patients; seven weeks, one patient; eight weeks, three patients; sixteen weeks, two patients.

The status of the 14 patients who developed empyema is as

follows: three patients are dead, death having occurred ten months, thirteen months and ten months respectively following operation. In the case of one patient the empyema subsided spontaneously and pneumothorax is being continued. As regard to another case, in this patient also spontaneous recovery from the empyema seems likely to occur, and there appears also a reasonable prospect of the pulmonary condition becoming stabilized without further active measures. In the case of one patient, cure of the empyema followed treatment with penicillin and complete expansion of the lung occurred. Two patients have had thoracoplasty performed, and the result in both patients has been satisfactory from the point of view of obliteration of the pleural space and also as regards control of the pulmonary lesion. The prognosis of two patients appears to be hopeless; in neither case could major surgery be contemplated. As regards another case, on present indications the ultimate outlook for this patient also appears to be hopeless. In three cases (one already mentioned), thoracoplasty will probably be necessary.

Of the 14 patients in whom empyema occurred in eight the empyema was preceeded by spontaneous pneumothorax.

In studying the patients in whom empyema occurred it is seen that, with one exception, all had extensive adhesions. Naturally the question arises as to the advisability of attempting pneumonolysis in patients in whom extensive adhesions are present. After close study I believe that with my present experience I would probably not have attempted pneumonolysis in the case of four of the patients in whom empyema occurred. I would still regard the remaining ten patients as suitable for pneumonolysis; a large number of patients in my series who have been operated upon without incident and in whom an excellent final result has followed have had adhesions of equal or greater complexity than were present in these ten patients. Pleural adhesions are so variable in arrangement and complexity that it is difficult to make fixed rules as regards suitability for operation. As mentioned above, I have become more and more averse to attempting pneumonolysis in cases in which it is necessary to leave an adhesion partly freed. This applies more particularly to the type of adhesion in which one free edge can be defined but in which the other border merges into an area where the lung is adherent to the parietes. This type of adhesion is not infrequently seen in the posterior apical region in cases in which the posterior surface of the apical and subapical portions of the lung is adherent to the chest wall. As regards those adhesions in which both borders can be clearly defined, provided that pneumonolysis is possible at all, I now rarely find more than one operative stage to be required

for complete freeing to be effected. This experience of course has no relation to the case, multiple adhesions being present, in which some adhesions are freed at one operation and the remainder left for a further stage.

In assessing the suitability of patients for pneumonolysis, my tendency has been to become more conservative.

The treatment of tuberculous empyema has always presented a problem of extreme difficulty. In the case of those patients who have still been under my care when the empyema was first noted, treatment has been by repeated aspiration. In one case recovery followed; it must be mentioned that in this case tubercle bacilli were never recovered from the pleural fluid, and the diagnosis of tuberculous empyema was presumptive only. In one other patient recovery seems likely to take place. In another case complete recovery from the empyema occurred as a result of treatment with penicillin, but in this case the empyema was not of tuberculous origin. The present position as regards the treatment of tuberculous empyema is that the great majority of patients suffering from this condition ultimately require thoracoplasty to close the pleural space.

TABLE IV

Author	No. of Patients	Type of Empyema		Total
		Tuberculous	Pyogenic and Mixed Infection	
		<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
Anderson and Alexander	87	4	2	6 (7.2)
Brock	302	5	5	10 (3.3)
Chandler (1st series)	89	3	4	7 (7.8)
Chandler (2nd series)	68	1	0	1 (1.4)
Drash	230	6	0	6 (2.6)
Edwards and Lynn	226	32		32 (13.5)
Goorwitch (four surgeons)	373			31 (8.3)
Goorwitch (collected series)	5,114	(3.5)	(1.4)	(4.9)
Matson	249	41		41 (16.5)
Newton	148	3		3 (2.0)

Matson, in 1934,¹⁹ published an interesting discussion of his 249 cases. His first group included 136 cases in which the Jacobaeus technique, with the use of the galvano-cautery, was used; in the second group of 35 cases he used electrosurgery with what he describes as an obsolete high-frequency unit; in the final group of 78 cases he used electrosurgery with a Bovie high-frequency unit.

Matson attributes the progressive improvement in his results to the different methods used. However, it may perhaps not unreasonably be suggested that his greater experience of pneumonolysis, apart from the method used, may have played a part.

In the last 100 cases in my series to have pneumonolysis performed, empyema occurred in three cases; two of these cases I would not now consider suitable for pneumonolysis. In the last 75 cases in my series to have pneumonolysis performed, empyema occurred in one case only.

TABLE V
(Adapted from Matson)

	Jacobaeus's Method		Author's Method			
	Galvano-cautery 136 Cases		Unnamed high-frequency Unit. 35 Cases		Bovie high-frequency Unit. 78 Cases	
	Number	Percentage	Number	Percentage	Number	Percentage
Purulent exudate	36	26.4	4	11.4	2	2.5

Spontaneous Pneumothorax: Spontaneous pneumothorax has occurred nine times in my series. Eight of these cases have already been mentioned in the discussion of those patients who developed empyema. The remaining patient had several adhesions which I had proposed to free in two stages. The first stage was completed, one adhesion, however, being left partly divided. Convalescence was uneventful until eighteen days following operation, when a refill of air was given. A few hours following this refill spontaneous pneumothorax occurred. The pneumothorax was of the valvular type, and death resulted. The rupture of the lung in the case of this patient was thought to be the result of tearing of the incompletely freed adhesion following the refill of air. This case adds point, I think, to my objection, stated above, to leaving any adhesion partly freed; if this has been done, subsequent refills of air must be given with very great caution, care being exercised that sufficient air is never given to cause the pressure in the pleural cavity at the end of expiration to become positive.

In three of the nine patients in whom spontaneous pneumothorax occurred the rupture of the lung was followed by a persistent broncho-pleural fistula. In one case the fistula appears to have sealed over after being patent for about five months. In one case the fistula remained patent until death occurred ten months later. In the third case, as was noted when discussing the empyema which resulted, the rupture in the lung became sealed over following the original break-through, and indeed spontaneous cure of the empyema seemed to have occurred when,

eighteen months following operation, a second rupture occurred; this rupture has been followed by a persistent broncho-pleural fistula.

The seriousness of spontaneous pneumothorax as a complication of pneumonolysis is exceeded only by the occurrence of massive uncontrollable hemorrhage from a major blood vessel. When spontaneous pneumothorax occurs as a complication of pneumonolysis, empyema is almost certain to follow. Few patients suffering from tuberculous empyema recover from the condition with conservative treatment; in the majority, sooner or later thoracoplasty will become necessary, either to obliterate the pleural space or in the case of the few patients in whom expansion of the lung has taken place, to deal with the lesion in the lung for which artificial pneumothorax was originally induced. As regards those patients in whom the empyema is due to an organism of the pyogenic group, uncomplicated by the presence of tubercle bacilli, the discovery of penicillin has greatly improved the prognosis as regards the empyema; however, as cure of the empyema entails expansion of the lung, the lesion in the lung remains to be dealt with, and here again thoracoplasty usually must be considered.

In cases in which a persistent broncho-pleural fistula results the prognosis immediately becomes much more serious still. The seriousness of this complication underlines the necessity for reducing its occurrence to a minimum by scrupulous attention to the details of technique, and by judicious selection of patients for operation. The incidence of spontaneous pneumothorax in Goorwitch's¹⁵ collected series is given as 2.3 per cent and the incidence of broncho-pleural fistula as 2.5 per cent. Although not absolutely clear, it would appear that none of the patients shown as developing broncho-pleural fistula are included among those recorded as having suffered spontaneous pneumothorax. This would give a total incidence of rupture of the lung of 4.8 per cent. (This percentage is relative to the number of operative stages).

Pleuro-cutaneous Fistula: Pleuro-cutaneous fistula has occurred in five patients, in all as a complication of empyema. Two of these patients have had thoracoplasty performed; in addition to a generally excellent result from this operation in both patients, in one patient the pleuro-cutaneous fistula has closed, and in the other only a small superficial sinus remains. In each of the other three patients the fistula is still patent.

Shock: One patient, a female aged thirty-six years, died about forty-eight hours following operation. Death in this case was attributed to shock resulting from the operation.

This patient had had artificial pneumothorax induced on the right side about four years before her death. She came under my

care about two years following the original induction of pneumothorax, the intervening period having been spent in a sanatorium. When she was seen by me her condition was unstable. Pneumothorax was being maintained on the right side and the lesion in the lung on this side appeared to be under control. She had, however, a small lesion in the left apex and tubercle bacilli were recovered on culture of the fasting stomach contents. Her condition remained unchanged for about fifteen months, after which deterioration was apparent in the lesion in the left lung. Progressive deterioration continued to be evident, both in the patient's general condition and in the lesion in the left lung. About two months before her death, although it was realized that she was a very poor subject, it was decided that the only possibility of halting the spread of the disease was to supplement the bed rest she was then having, with artificial pneumothorax therapy on the left side. Pneumothorax consequently was induced, but was ineffective because of adhesions. She was not a good subject for pneumonolysis, and I hesitated before deciding to submit her to operation; the alternative was, however, to abandon the pneumothorax. Two months were allowed to elapse in the hope that she would become accommodated to the pneumothorax, and as at the end of this period the temperature had been normal for several weeks, it was decided to attempt pneumonolysis. Several apical and subapical adhesions, which offered no technical difficulty, were freed. In addition to these adhesions there were two bands in the mid-zone, at the base of which in each case one or two tubercles were seen; on account of the presence of the tubercles these adhesions were, as I decided, unsuitable for operation. There was one further adhesion present at the extreme apex, the freeing of which I thought might give adequate relaxation of the lung. However, in spite of the fact that up to this stage the operation had not been of a severe character, her general condition was not satisfactory. Dyspnea had been present throughout the operation and appeared to be becoming more pronounced. Consequently I decided not to free this adhesion. Following the operation, her general condition did not show any appreciable improvement, and death occurred about forty-eight hours later. Spontaneous pneumothorax did not occur, nor had there been any hemorrhage. Autopsy was performed and revealed widespread miliary involvement. Death in this patient was, I believe, caused by shock resulting from the operation in a patient whose general resistance had become greatly lowered by a protracted debilitating illness. In view of the finding at autopsy it is unlikely that, in any case, death would have been delayed beyond a couple of months.

This patient was a borderline case in which to attempt pneu-

monolysis, or even for the induction of pneumothorax; however, the latter procedure having been undertaken, pneumonolysis became a logical outcome unless an absolute contraindication should be present. In actual fact this contraindication did exist, in the form of millary spread, but on the evidence this condition could not be diagnosed before operation.

Obliterative Pleuritis: A late complication of considerable interest, occurring in patients who have been submitted to pneumonolysis, is obliterative pleuritis. This process, as is well known, is a relatively common mode of termination of artificial pneumothorax. Alexander believes that the condition occurs in artificial pneumothorax more frequently in those patients who have had pneumonolysis performed. Since obliterative pleuritis may become evident at any stage during the period in which artificial pneumothorax is being maintained, it follows that the longer a given series of patients is followed the higher will be the incidence of this condition. The tempo of the obliterative process, once it has commenced, is variable. In some cases the process may reach the stage at which the inferior surface of the lung has become adherent to the diaphragm, after which no advance may occur over a considerable period; in this type of case effective pneumothorax may frequently be continued for a considerable time. On the other hand the advance of the process may be relatively rapid and the pneumothorax space become obliterated within a few weeks. A very important factor in the development of obliterative pleuritis is the occurrence of persistent pleural effusion. In some patients, on the contrary, the condition may gradually develop, although little or no fluid may have been noted in the pleural cavity at any period during the maintenance of the pneumothorax.

In recording the incidence of obliterative pleuritis in a series of patients such as the one under review, it is sometimes difficult to decide to what extent, if any, pneumonolysis has been a factor. However, all patients have been included, at whatever period following operation the condition has become evident, whether the process appears to have become stationary at the stage at which the lower surface of the lung has become adherent to the diaphragm or whether it has been possible for the pneumothorax to be continued or not.

Of the 43 patients in my series on whom thoracoscopic examination only was performed, in the case of one patient obliterative pleuritis became evident about four months following operation. In a relatively high proportion of patients in this group pneumothorax was voluntarily abandoned when it was found impossible to render the collapse effective.

Of the 225 cases in which pneumonolysis was performed, in six,

commencing oblitative pleuritis was evident prior to operation. In two, little advance in the process has taken place and pneumothorax is being continued twenty and twenty-one months respectively subsequent to operation. In one patient the oblitative process showed evidence of progression two months following operation, and four months following operation pneumothorax was abandoned. In one patient, in whom it had been difficult to maintain pneumothorax because of the rapid absorption of air, after about four months the oblitative process was seen to have advanced considerably and the pneumothorax was rapidly lost. In one patient, after four months the oblitative process was noted to be progressing, and eight months following operation pneumothorax was abandoned. In the case of the remaining patient I have been unable to obtain precise information, but the oblitative process appears to have commenced to advance six months following operation and pneumothorax was abandoned a few months later. Of the four cases in which it became necessary to abandon pneumothorax, in two cases postoperative pleural effusion appears to have been a contributing factor in the progress of the oblitative process.

With regard to 219 cases in which no evidence of oblitative pleuritis was noted prior to pneumonolysis, in 28 cases this condition developed at some period subsequent to operation.

Consequently, of 225 cases in which pneumonolysis was carried out, oblitative pleuritis either has occurred, or in cases in which it was present prior to operation has progressed at some period subsequent to operation in a total of 32 cases (14.2 per cent).

In four cases the condition became evident less than three months following operation; in eight cases the period was between three months and six months following operation; in ten cases the period was between six months and twelve months following operation; in five cases the period was over twelve months following operation; in one case the period is uncertain, but it is known that pneumothorax was maintained for thirteen months following operation.

Including the four patients in whom oblitative pleuritis, present before operation, progressed subsequent to operation, in one case it was necessary to abandon pneumothorax less than three months following operation; in three cases the period was between three months and six months; in nine cases the period was between six months and twelve months; in eight cases the period was over twelve months. In eleven cases in which commencing oblitative pleuritis has become evident pneumothorax is still being maintained. In five cases over eighteen months have elapsed since pneumonolysis; in four cases between twelve months and eighteen

months have elapsed; in two cases six months and seven months respectively have elapsed.

In a number of the patients in whom oblitative pleuritis has become evident at some period following pneumonolysis, the maintenance of pneumothorax following operation has been of sufficiently long duration for the closure of cavities to have been effected. Of the 32 patients in whom oblitative pleuritis became evident subsequent to pneumonolysis, or in whom a previously existing oblitative pleuritis progressed following pneumonolysis, in 17 cases the occurrence of pleural effusion seems to have been a factor in originating the process, or in causing the process to advance in those cases in which it was evident prior to operation. In 12 cases the effusion occurred in the postoperative period, here considered as the period of two months subsequent to operation. In five cases a varying period elapsed from the time of operation to the occurrence of the effusion.

In Goorwitch's¹⁵ collected series the occurrence of oblitative pleuritis is estimated at 7 per cent. However, in another paper by the same author,¹⁴ in which he discusses the complications which occurred following closed intrapleural pneumonolysis, carried out on 373 lungs by four surgeons, who operated at the one sanatorium, the incidence of oblitative pleuritis is shown as 85 cases (22.7 per cent). In the latter group of patients, Goorwitch appears to have had better facilities for arriving at an accurate assessment of this complication than in his larger collected series, with regard to which, in the case of a number of authors whose records were consulted, complete data seem to have been lacking. It is probable that the incidence of oblitative pleuritis in the larger series would have been greater than 7 per cent were complete records available.

Surgical Emphysema: Surgical emphysema in some degree has been of frequent occurrence in my patients following operation. Tightly applied strapping over a built-up pad of gauze has lessened the degree of emphysema, but except in a few cases has not been completely effective in preventing its occurrence. In a few patients in whom cough has been severe, extensive emphysema has occurred: in two patients extending upwards to the face and into the loose tissues around the eyes, and in one patient extending downward as far as the scrotum. Emphysema in the very great majority of patients, even in those in whom extensive emphysema occurs, is to be regarded as a temporary annoyance only.

In the case of two patients in my series expansion of the lung with loss of the pneumothorax space has occurred. In the first patient partial pneumonolysis only was done. In the case of the second patient extensive pneumonolysis had been carried out and

the lung had been completely freed; however, expansion of the lung occurred, and although it was possible to recollapse the lower zone it was found impossible to recollapse the upper lobe.

The usual explanation of this occurrence is that air escapes from the pleural cavity through the holes made by the trocar, and that the lung expands and becomes adherent to the chest wall. That this is the complete explanation was questioned by Brantigan, Hoffman and Proctor,⁴ writing in 1942. These authors reported loss of the pneumothorax space in four patients, following closed pneumonolysis. Fluoroscopic examination had been carried out three hours following operation, when almost complete re-expansion was present. Refills of air were given and repeated in four hours. However, the following day, in one patient complete re-expansion was present and in the other three patients complete expansion of upper and middle lobes had occurred, although partial collapse of the lower lobe was present. Brantigan, Hoffman and Proctor do not believe that excessive leakage of air, *per se*, is the cause of re-expansion of the lung in this type of case. They believe that the presence of endo-bronchial tuberculosis in the main stem bronchus, at the orifice of the branch bronchus, or within the lumen of the branch bronchus, explains the rapid loss of air from the pleural cavity. Following pneumonolysis, there is immediate improved collapse of the lung, accompanied in some cases by kinking of the bronchus. When kinking occurs in those patients in whom endo-bronchial disease is present, obstruction of the bronchus may follow. If the obstruction is complete, atelectasis of the complete lung, or of one lobe, will follow, depending on whether the main stem bronchus or a branch bronchus is involved. However, in cases in which the obstruction is incomplete a check valve action may be initiated. Air passes the obstruction in the bronchus during inspiration, but with the narrowing of the lumen of the bronchus during expiration air remains trapped in the lung distal to the blockage. This mechanism operates with every act of respiration. Rapid expansion of the lung beyond the obstruction consequently occurs. In such cases, then, the re-expanding lung forces air out of the pleural cavity into the tissues, and the concomitant emphysema is thus to be regarded as the result of this re-expansion, and not as its cause. In the four patients reported by Brantigan, Hoffman, and Proctor, endo-bronchial disease was later demonstrated.

It has always been difficult for me to understand, in cases of loss of pneumothorax space following pneumonolysis, how adherence between the lung and chest wall occurs so rapidly. I believe that the theory put forward by Brantigan, Hoffman and Proctor offers a satisfactory explanation of what happens in these

patients. Unfortunately, bronchoscopic examination was not carried out in the case of my two patients.

Anderson and Alexander¹ report losing the pneumothorax space once in their 87 patients; of Moore's²⁰ collected series of 2,043 cases, in six cases the pneumothorax space was lost, and of Drash's¹⁰ 230 cases, in one the pneumothorax was lost. In Goorwitch's¹⁵ collected series of 5,114 cases the incidence of loss of pneumothorax space is given as 3 per cent.

Postoperative Vomiting: Postoperative vomiting has occurred in a number of patients. The possibility that the premedication might have had some bearing was considered—morphine and hyoscine were being used at the time; consequently in the case of two patients who were temperamentally suitable, premedication was dispensed with. In one of these patients moderately severe postoperative vomiting occurred. This complication has been noted by Brock,⁵ who considers it the result of the manipulation of the pleura and subplueral tissues at operation.

Dyspnea During Operation: Dyspnea during operation was complained of by three patients, in two of whom contralateral pneumothorax was being maintained at the time of operation. In two of these cases it was possible to complete the operation, uneventful convalescence following in both cases. In the third case several adhesions were freed, but the operation could not be completed. This patient has already been discussed in the section dealing with shock. Brock⁵ reports that in three cases he found it necessary to stop the operation because of this complication and in one case was compelled to abandon the operation completely. In addition to the three patients mentioned, there have been two or three others in whom a minor degree of dyspnea was present during operation. The importance of the dyspnea in the case of these patients was that on account of the large respiratory excursion the operation was rendered much more difficult; in such a patient if an adhesion to be cauterized were situated in a dangerous position, it might be necessary to abandon cauterization because of the hazard.

Injury to Nerves: Several patients have complained of numbness of the arm and forearm following operation. This usually passes off during the course of a few weeks. In one patient, while an adhesion was being enucleated the second intercostal nerve was seen and recognized; in this case a little numbness occurred in the upper part of the arm in the distribution of the second dorsal nerve, and tenderness on pressure could be elicited in the second intercostal space anteriorly. This tenderness gradually passed off. In one patient in whom extensive "peeling off" of the apex from the posterior portion of the chest wall was carried out, signs of

Horner's syndrome were noted immediately following operation; eighteen months later a little inequality of the pupils was still present in this patient.

An interesting complication occurred in one female patient in whom three apical bands had been freed. Immediately after operation she noticed that the hand on the same side as that on which pneumonolysis had been performed was warmer than the other. No other objective or subjective sign was present. This sign has persisted up to the time of writing, about six months following operation.

Alexander² has noted, in discussing nerve injuries following pneumonolysis, that in one of Saugman's patients paralysis of one-half of the diaphragm followed divisions of an adhesion in the medial part of the chest.

DISCUSSION

From the accumulated experience of many clinics in Europe and America, particularly during the past ten to fifteen years, the value of closed intrapleural pneumonolysis has been abundantly proven. With the aid of pneumonolysis, a useless and dangerous pneumothorax may frequently be rendered effective, with resultant satisfactory relaxation of the lung and, in many cases, closure of cavities and ultimate control of the lesion. Frequently, the patient is saved the necessity of undergoing an extensive plastic operation, which otherwise might be required to save life. In the case of patients in whom active contralateral disease is present, successful pneumonolysis may offer the only prospect of planning a program of treatment which gives to the patient any chance of survival.

The operation is one never to be regarded lightly by the surgeon. A complete knowledge of the pathology of pulmonary tuberculosis is essential, and the structure and mode of formation of pleural adhesions must be fully understood if a requisite technique is to be acquired by the surgeon. Alexander,² himself having a wholesome respect for the potential difficulties of the operation takes to task a surgeon who said that, "the technique of cauterization of adhesions, by the Jacobaeus-Unverricht method is simple and free from danger." Alexander's comment is that neither Jacobaeus nor Unverricht held that view. The technical difficulties in the case of the more complex adhesions may be very great indeed. Nevertheless if the operator is experienced, the incidence of serious complications should not be high, and in the case of the more simple adhesions should be relatively rare. Of the 96 patients in my series to have pneumonolysis performed, in whom were present adhesions of the order included in grades I and II

as described above, only one patient suffered any serious complication. With regard to thorascopic examination alone, the risk of complication occurring in patients submitted to this procedure should be very small indeed.

SUMMARY

The procedure of closed intrapleural pneumonolysis has been discussed. The results in a series of patients submitted to operation are reported and the postoperative complications are reviewed.

RESUMEN

Se ha discutido el procedimiento de la neumonolisis intrapleural cerrada. Se comunican los resultados obtenidos en una serie de enfermos sometidos a la operación y se analizan las complicaciones postoperatorias.

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The Eradication of Tuberculosis; the Greatest Health Problem in the Philippines

MANUEL QUISUMBING, SR., M.D., F.C.C.P.

City of San Pablo, Philippines

Tuberculosis is the most dreadful disease in the Philippines because of the very high mortality among our countrymen with devastating effects on the economic and social conditions. Consider the tens of thousands of human lives that succumb yearly to the disease and you will wonder how the Filipino people can survive in the long run. The total number of deaths due to tuberculosis in 1936 amounted to 32,235 which is almost equal to the combined total mortality from five of the most prevalent diseases in the Philippines, such as malaria, influenza, beri-beri, dysentery, and typhoid which, in the same year, caused 35,955 deaths. The latest report from the Health Service shows that the death rate of tuberculosis has increased during the last war to 35,000 deaths per year. In other words *one* Filipino died of tuberculosis in the Philippines every fifteen minutes.

Hundreds of thousands of our countrymen are suffering from active tuberculosis and as such we may consider them as non-productive elements in the community. From the economic standpoint the estimated losses are as follows: For every death, P 1,000.00; for loss in production, P 600.00; for cost of treatment and food, P 365.00; and for funeral expenses, P 20.00. The thirty-five thousand (35,000) deaths from tuberculosis represent therefore, an economic loss of 69,475,000 pesos per year. Assuming, from the epidemiological and statistical point of view, that for every death from tuberculosis there are in existence 12 cases with active process, then, it can be considered that approximately 420,000 Filipinos are actually suffering from the disease. These cases are the ones responsible for the continuous spread of infection and dissemination of tuberculosis to the rest of the population. For these 420,000 tuberculous patients, evaluating each patient becoming a non-productive element at P 600.00 per year, and the cost of treatment and food, P 365.00 per year, then the total loss amounts to 405,000,000 pesos annually. The total economic loss for those 35,000 deaths and for the 420,000 tuberculous patients is therefore 69,475,000 and 405,300,000 pesos, respectively.

A comparison of the mortality in the Philippines with that in other countries such as the United States, England and Germany:

United States of America	(1929)	90,000
"	(1940)	60,000
England	(1927)	38,173
"	(1937)	35,000
Germany	(1927)	61,408
"	(1936)	57,000
Philippines (18,000,000)	(1930)	33,000
"	(1940)	35,000

CAUSES OF THE PREVALENCE OF PULMONARY TUBERCULOSIS AMONG THE FILIPINOS

The disease is a very old one in our country. It was mentioned by Spanish writers since 1521. Some methods of cure were recommended then, betraying ignorance of the real cause of the disease. Although American administration in the Philippines was organized in 1901 and the Department of Health began its work the following year, its activities were directed and limited to the control of the prevailing diseases at that time, namely, bubonic plague, cholera, dysentery, small-pox, etc.

The first measure against tuberculosis was started on June 30, 1908, when the Municipal Board of Manila enacted Municipal Ordinance 104, Section 928, now amended as Section 208 of Municipal Ordinance 285, prohibiting expectoration in public places. It can be asserted that during the Spanish regimen and during the early years of American occupation forty years ago, almost nothing had been done effectively to control or to eradicate tuberculosis among our countrymen. It spreads everywhere and in every place so that there is hardly any Filipino home today that has not been visited by the ghost of tuberculosis.

Among the most outstanding predisposing causes or conditions which favor the transmission of the disease from one person to another are the following:

Ignorance and lack of sanitary and hygienic education: The majority of the Filipinos are still completely ignorant about the origin, causes, and means of infection of tuberculosis. Although hygiene and sanitation are taught to our children in the public and private schools, in the homes their parents are reluctant to apply the preventive measures taught in the schools. The traditional Filipino customs of taking care of tuberculous patients (living in the same room, using the same utensils in eating, spitting anywhere, etc.) remain unchanged. Thus, the contagion is general, particularly to the infants who are very susceptible to infection. More and more persistent educational campaigns should be carried out among our people in order to achieve fruitful results.

Poverty: Tuberculosis is more rampant among the poorer classes, especially the laborers. This was generally observed among those who exert great physical efforts in their work or who spend more energy in the performance of their duties, such as the laborers and workers in the commercial and industrial firms. Poverty means undernourishment, poor housing, overcrowding, excessive work, moral depression and lack of resistance.

Economics: If we consider the daily wages of our laborers which average P 5.00 in the City of Manila and P 4.00 in the provinces, and compare these with the actual cost of living, particularly during these post war days, we can easily understand that the income of our laborers is hardly sufficient to enable them to maintain a normal standard of living. The laborers or the poor class are more prolific than those belonging to the middle class. The average components of a family are 5 to 6 members. Quarters in the slum district of the City of Manila costs ordinarily P 0.50 daily for the whole family; and food, including rice, costs from 2.00 to 3.00 pesos. There is nothing left for clothing and medicine even for slight ailments. In a case where there is one sick of tuberculosis in a family, overcrowding and promiscuous sleeping result in contagion for the whole family.

Undernourishment: The insufficient intake of food or the lack of a balanced diet in the daily life of our people causes low body weight, weak constitution and great susceptibility to the disease.

Filipinos are easy victims of tuberculosis. They are dying of tuberculosis because they are undernourished; they are undernourished because they are poor; and they are poor because they are not receiving enough income for a standard mode of living. Our natural resources are still undeveloped.

Social conditions: Poverty and economy are social problems. Unless our resources, agricultural and industrial, are developed by the Government, the condition of poverty and poor economy in the country cannot be improved and settled. There is a need to overhaul the primitive system of cultivation of our land to increase the yield of the soil for the benefit of the laborers in the fields. For example, rice production in the Philippines gives an average of 30 cavanese per hectare. This can be doubled or tripled by employing a mechanical plow which digs deeper into the soil, the use of fertilizers to increase the yield, the use of automatic grain drills instead of the primitive way of seed planting by hand, the proper selection of seeds for planting, etc. With the increase in crop production, there will naturally be an increase in the share of the tenant.

Industry can be aided also by the Government by transforming water power in Luzon and Mindanao into hydro-electric plants

which may produce cheap electricity for the creation of home industries. The problem of tuberculosis control is not only medical but also economic and social.

Previous Diseases: All factors that may cause weakness of the body or previous illnesses, such as malaria, influenza, pneumonia, diabetes, intestinal parasitism, etc., which lower the body resistance, contribute to the rapid development of the disease.

War conditions: The increase of the incidence and its high mortality during the three years of Japanese occupation, which up to the present time prevail, may be attributed to lack of food or undernourishment, to worries and its side effects on the nervous system, and to the hardships of life created by the Japanese brutality and atrocity during the whole period of occupation. The above opinion can be deduced from the following tables:

TABLE I — BEFORE JAPANESE OCCUPATION

Year	No. of Examinations	Total No. Positive Cases	Rate per 100
1939	262,804	16,652	6,336
1940	261,143	15,294	5,857
1941	175,701	10,858	6,180
TOTAL	699,648	42,804	6,118

TABLE II — DURING JAPANESE OCCUPATION

Year	No. of Examinations	Total No. Positive Cases	Rate per 100
1942	27,312	4,418	16,176
1943	45,113	7,419	16,455
1944	29,581	5,948	20,108
TOTAL	102,006	17,785	17,435

CAMPAIGN AGAINST TUBERCULOSIS IN THE PHILIPPINES

The Bureau of Health and the Philippine Tuberculosis Society are the Government and semi-government enterprises, respectively, that carry out all the activities to control and eradicate tuberculosis in the Philippines. The latter started the campaign against the disease since its organization in 1910 with the opening of the San Juan del Monte Sanatorium near Manila. Since that time, year after year, the Society included among its activities the establishment of pavilions and dispensaries provided with x-ray facilities, laboratory and pneumothorax equipment in Manila and in the provinces. Early diagnosis of the disease and proper treat-

ment were given to tuberculous patients. Education and propaganda to the public about tuberculosis were not overlooked by the physicians and nurses in charge of the sanatoria, pavilions and dispensaries.

In 1937, the main building of the Quezon Institute (formerly the Santol Tuberculosis Sanatorium) was erected, and in 1941 the wings of the Institute were completed fully equipped with the latest x-ray apparatus and tomography, modern laboratory equipment with facilities for research work, air-conditioned operating room, surgical and eye, ear, nose, throat, and physiotherapy clinic; orthopedic clinic, morgue equipped and electrically operated refrigerator, incinerator, etc. The Quezon Institute is a modern up-to-date sanatorium in the Orient whose buildings and pavilions were patterned after the most modern system of hospital construction in the United States. Its capacity was for more than 1,300 beds. The Quezon Institute became famous through its medical director, Dr. Miguel Canizares, whose leadership as anti-tuberculosis campaigner is duly recognized in the Philippines and abroad.

The Philippine Tuberculosis Society also established sanatoria in the cities of Ilo-Ilo, Cebu, and Baguio; pavilions and dispensaries in the capitals of various provinces such as in Zamboanga, Capiz, Tacloban, Vigan, Tuguegarao, Naga, Cabanatuan and Calamba. The fundamental policies of the Society carried out in all the corners of the country were as follows:

- (a) To inform the public about the modes of infection of the disease and the methods of prevention.
- (b) To combat the spread of the disease and to afford the necessary relief to afflicted persons with all available means.

The outstanding work undertaken by the Quezon Institute were as follows: (1) training private physicians and fellows of the Bureau of Health in the diagnosis, treatment and prevention of the disease; (2) teaching and acquainting the undergraduate interns of the three medical colleges of the country with the various phases of tuberculosis, stressing principally the important role that they as future practitioners must play in the control of tuberculosis; (3) treating, educating, training, and rehabilitating tuberculous patients for the new life after they have been discharged; (4) induction of collapse therapy in suitable cases; and (5) conducting research and investigations on tuberculosis.

The Society also offered the Out-Patient Service, Dispensary Service, and Home Treatment Service which rendered invaluable benefits to the suffering patients of tuberculosis.

Out-Patient Service: The services were rendered to poor people who could not afford the payment of private physicians, especially when there is a need of a thorough examination of the chest by

x-ray for tuberculosis and other diseases. It also furnished information and assistance in securing sanatorium care for any person suffering from the disease.

Dispensary Service: Day and night, free service to indigent patients was also opened to the public. Dispensary service was especially offered to laborers who had no time to attend the consultations during the day. The dispensaries were strategically located in various districts in the City of Manila and in several provinces to help the poor people who could not afford to pay private physicians. This service provided for periodic health examination including free treatment of the disease. The services rendered by the dispensary in close cooperation with the outpatient service, stressed the value of periodic health examinations and early diagnosis with proper medical care.

Home Treatment Service: This service proved to be also a public need because of the ever-increasing tuberculous patients who attended the dispensaries in Manila and provinces, most of them requiring hospitalization but no accommodation was available. These poor patients then were provided with an expert and competent medical service and nursing follow-up attendance. The education provided by the home treatment service in matters of prevention and control is also very beneficial to the people.

PHILIPPINE TUBERCULOSIS COMMISSION

The Government of the Philippines began the control of the disease on November 24, 1930, when it created the Philippine Tuberculosis Commission by virtue of Act No. 3743. This commission functioned from February 16, 1931, to December 31, 1932. In 1933, a reorganization act was approved, transferring the functions of the Philippine Tuberculosis Commission to the Bureau of Health. A section of the said Bureau now called the Tuberculosis Control Section is in charge of all activities concerning this disease. The campaign against tuberculosis conducted by the Bureau of Health, Bureau of Education, community assemblies, and the community social centers. The school children were reached through the school teachers, nurses, and physicians; the adult population through lectures, conferences, and radio talks from time to time by physicians, nurses, social workers, and health specialists. The health agencies gradually extended to rural districts through tuberculosis clinics.

Diagnosis: The case finding was done by traveling x-ray units which conducted fluoroscopic examinations, and by health officers in various clinics and dispensaries in the provinces. Private practitioners rendered valuable services cooperating with the Government in this respect.

Relief and Treatment: The San Lazaro Hospital, Manila, with a 200 bed capacity under the Bureau of Health also gave admission to tuberculous patients of the moderate and far advanced cases. There were also cottages for tuberculous patients in Baguio and several pavilions and dispensaries in the provinces.

Lastly, physicians and nurses undertook follow-up work through home visits. At the same time health officers rendered remedial services to the sick whenever these measures were available and needed.

Tuberculosis Research: Tuberculosis investigations were accomplished by three sections, namely, (1) bacteriological laboratory; (2) pathological laboratory; and (3) section of routine sputum examination.

The benefits of the services rendered by the Philippine Tuberculosis Society and the Bureau of Health through their agencies cannot be underestimated as they undoubtedly contributed to the prevention, control and treatment of tuberculous patients. Much had been done, but much more remains to be done.

THREE YEARS OF INACTIVITIES

Due to the prevailing unfavorable conditions during the three years of Japanese occupation, the activities of the Philippine Tuberculosis Society and the Bureau of Health were curtailed. The Quezon Institute was occupied by the armed forces of the Japanese, while its personnel and part of the equipment was transferred to San Juan de Dios Hospital, located in the Walled City in Manila. The hospital had 400 beds. There were also eleven other tuberculosis pavilions and dispensaries operated throughout the Islands. The said hospital was an old building, not proper to accommodate tuberculous patients. The tuberculosis cottages of the Bureau of Health in Baguio and several pavilions and dispensaries in the provinces were also adversely affected in their functions.

Incidence and mortality due to tuberculosis having been reduced in the previous years prior to the outbreak of the war have shown again an increase. According to a recent report from the Health Service, Manila, the death rate of tuberculosis reached to 830 for every 100,000 persons as against 230 before the war.

P 1,000,000 FOR TUBERCULOSIS DRIVE

After the liberation of the Philippines by the American Armed Forces, President Sergio Osmena of the Philippine Commonwealth Government approved the H. B. No. 543 providing for the appropriation of 1,000,000 pesos for the rehabilitation of the Philippine Tuberculosis Society to enable this organization to operate again

the Quezon Institute and other agencies engaged in the fight against tuberculosis.

Wider and more extensive tuberculosis campaigns throughout the Philippines are badly needed because of the great mortality of our people due to tuberculosis as a sequel to the war. To a great evil, a great remedy is needed.

CREATION OF THE NATIONAL COUNCIL FOR TUBERCULOSIS CONTROL

In view of the extent and magnitude of the tuberculosis problem in the Philippines, there is a national call for unification and consolidation of efforts of the various entities working for the prevention and control of the disease. The inconvenience of multiple directorates, overlapping of work, lack of coordination, misunderstanding, and waste of money should be avoided.

I believe that to achieve better results in our campaign against tuberculosis, the creation by the Philippine Congress of a central organization which will synchronize or embody the functions of various tuberculosis institutions such as the Philippine Tuberculosis Society, the Bureau of Health, and the White Cross is necessary. This organization may be called "The National Council for Tuberculosis Control."

ORGANIZATION

It should be composed of a full-time medical director, a specialist as phthisiologist; another phthisiologist as executive officer and secretary; and a board of directors composed of the president of the Philippine Tuberculosis Society, ex-officio; the director of the Bureau of Health, ex-officio; the President of the Philippine Medical Association; the president of the Private Practitioners Association; a representative of the Social Workers Association; and a representative of agricultural, commercial, and industrial enterprises. This national organization should draft a program for *Ten Years' Activities* under a coordinated plan of campaign against the disease, and for this purpose *Five Sections* to carry out the following activities should be created:

1. Section on education and propaganda.
2. Section on epidemiology and statistics.
3. Section on hospitals, sanatoria, pavilions and dispensaries.
4. Section on rehabilitation and social services.
5. Section on research and investigation.

* *Section of Education and Propaganda:* Information about tuberculosis should reach all vital elements of the community and no person or group of persons must be left unapproached. These include the following:

- (a) Schools, colleges, and universities.
- (b) Government offices, agencies and other entities.
- (c) Association of all kinds; medical and nursing, dental, fraternal, cultural, etc.
- (d) Clubs: women, civic, sporting, social, etc.
- (e) Agricultural, industrial and commercial organizations.
- (f) Newspapers.

Not only information about tuberculosis should be given to the above mentioned groups, but also aid and help should be furnished.

Section on Epidemiology and Statistics: The personnel of the Bureau of Health may be requested to do this work, namely, to furnish the Council all data concerning this matter.

Section on hospitals, sanatoria, pavilions and dispensaries: The diagnosis and treatment of tuberculous patients should be done by the Philippine Tuberculosis Society through its agencies, namely, the Quezon Institute, the Central Dispensary in Manila, and the Sanatoria, pavilions and dispensaries in the provinces including mobile x-ray units.

The San Lazaro Hospital for tuberculous patients in Manila, pavilions and dispensaries including their mobile x-ray units with pneumothorax clinics, now under the Bureau of Health, with their personnel should be transferred to the Philippine Tuberculosis Society. This organization should undertake the mass survey of (1) all contacts to known cases of tuberculosis; (2) persons suspected of suffering from tuberculosis, under professional treatment of private physicians; and (3) all persons living in certain districts where mortality is known to be excessively high.

The establishment of more sanatoria, pavilions and dispensaries to accommodate patients who need confinement in such institutions for treatment must be encouraged.

WHITE CROSS

The only preventoria established in Manila by the White Cross should take care of the children of tuberculous patients.

Rehabilitation and Social Services: The economic and social rehabilitation of tuberculous patients should be given serious consideration by the authorities concerned. Official agencies have underestimated the importance of rehabilitation but it is useless to spend thousands of pesos for treatment of tuberculous cases if upon discharge from sanatorium, tuberculous patients suffer relapse because of the reactivation of their previous disease.

No person can remain physically fit if he is not economically rehabilitated to enable him to select the kind of work suitable to his condition. When a tuberculous patient is maladjusted economically to the environment, he remains a potential danger in spread-

ing the infection to his family and the community at large.

In most cases a poor tuberculous patient who needs confinement in a sanatorium cannot stay for complete treatment unless his dependents are provided with some aid from the government or from charitable institutions. The patient will prefer to remain outside of the sanatorium without chance of cure, for fear of leaving his dependents unprovided for.

The insurance of the laborers for their protection in case of sickness should be studied carefully by the Government in relation to this social problem.

Research and Investigation: The following should be undertaken: scientific research on tuberculosis immunization; the study of native medicinal plants for possible therapeutic application; nutrition of tuberculous patients; application of chemotherapy and antibiotics; social rehabilitation of cured patients, etc.

FUNDS

To finance the ten year project of activities of the National Council for Tuberculosis Control, once created by the Philippine Congress, the Government should set aside a revolving fund of thirty million pesos (P 30,000,000) as a general fund to be deposited at the National Treasury, one-tenth (P 3,000,000) of which may be spent yearly. The total amount may be covered from the General National Funds and partly from public contributions, and from the proceeds of the Philippine Charity Sweepstakes. All subsidy or aid to the Philippine Tuberculosis Society, its agencies, to the White Cross and others, should be passed and approved by the Board of the National Council of Tuberculosis Control.

Tuberculosis causes thirty five thousand deaths and four hundred seventy four million pesos loss to our economy per year. Its eradication remains a national problem of the Philippines after Independence Day on July 4, 1946. So, to save our country from the catastrophe, the Filipino people should be united in the fight against tuberculosis in all corners of the Philippines.

SUMMARY

1. Tuberculosis is the most dreadful disease in the Philippines because of the very high mortality among our countrymen, with devastating effects on our economic and social conditions.

2. The *thirty-five thousand (35,000) deaths* from tuberculosis during the war represent an economic loss of *sixty nine million and four hundred seventy five thousand pesos (P 69,475,000)* per year, and the 420,000 Filipinos actually sick of tuberculosis represent an economic loss of another *four hundred five million and three hundred thousand pesos (P 405,300,000)* yearly.

3. The causes of the prevalence of pulmonary tuberculosis among the Filipinos are: (1) Ignorance and lack of hygiene and sanitation; (2) poverty; (3) poor economy; (4) undernourishment; (5) social conditions; (6) previous diseases; and (7) post-war conditions.

4. The campaign against tuberculosis has been undertaken by the Philippine Tuberculosis Society and the Bureau and their agencies. They established hospitals, sanatoria, pavilions and dispensaries throughout the Islands and the outstanding phases of their activities were educational, diagnostic, relief, treatment, research and investigations.

5. The prevailing conditions during the three years of Japanese occupation caused an increase of incidence and mortality of tuberculosis due to lack of food or undernourishment, worries and their side effects on the nervous system, hardships in life created by the Japanese brutalities and atrocities, and inadequate medical attendance.

6. There is need of a national call for unification and consolidation of efforts of the various entities working for the prevention and control of the disease. The inconvenience of multiple directorates, overlapping of work, lack of coordination, misunderstanding, and waste of expenditures should be avoided.

7. The creation of the *National Council for Tuberculosis Control in the Philippines* is proposed.

8. The eradication of tuberculosis in the Philippines as a national problem after Independence on July 4, 1946, calls for the unification of the Filipino people to fight this disease in all corners of the Philippines.

RESUMEN

1. La tuberculosis es una terrible enfermedad causante de una gran mortalidad entre los Filipinos con grave daño de su condición económico-social.

2. Las treinta y cinco mil muertes (35,000) causadas por la tuberculosis durante la guerra, representan una pérdida económica para el país de sesenta y nueve millones cuatrocientos setenta y cinco mil pesos (P 69,475,000) por año, y los 420,000 enfermos actuales de tuberculosis, representan otra pérdida económica de cuatrocientos cinco millones trescientos mil pesos anualmente (P 405,300,000).

3. Las causas de la prevalencia de la tuberculosis pulmonar entre los Filipinos son: (1) Ignorancia y falta de Higiene y Sanitación; (2) Pobreza; (3) Economía limitada; (4) Nutrición deficiente; (5) Condición social; (6) Enfermedades anteriores; y (7) Condiciones de la post-guerra.

4. La campaña antituberculosa en Filipinas ha sido llevada a cabo por la Philippine Tuberculosis Society y el Bureau de Sanidad y sus agencias hasta ahora. Se han establecido Hospitales, Sanatorios, Pabellones y Dispensarios antituberculosos en todo el archipiélago y sus actividades se han extendido en la educación, diagnóstico, tratamiento y en investigaciones sobre tuberculosis.

5. Las condiciones reinantes durante los tres años de ocupación japonesa causaron incremento en la incidencia y mortalidad de la tuberculosis, debido a la escasez de alimentos, depresión moral, dificultades y sufrimientos de los Filipinos por las brutalidades y atrocidades de los japoneses y falta de asistencia médica a nuestros enfermos.

6. Por necesidad nacional deberán unificarse y consolidarse todos los esfuerzos de las varias entidades dedicadas a la prevención y control de la tuberculosis. Las inconveniencias de una dirección múltiple, la duplicidad en los trabajos, falta de coordinación, mala inteligencia y gastos superfluos se evitarán en lo futuro.

7. La creación del *National Council for Tuberculosis Control* en Filipinas es su remedio.

8. La erradicación de la Tuberculosis en Filipinas es un problema nacional después de su Independencia en el 4 de Julio de 1946, y este acontecimiento es un llamamiento para que todos los Filipinos se unan en la lucha contra la tuberculosis que deberá entablarse en todos los rincones del país.

REFERENCES

- 1 "Proceedings of the First National Congress on Tuberculosis," December 13-18, 1926.
 - 2 "Preliminary Report of Activities by the Tuberculosis Commission during Part of 1931 and Part of 1932."
 - 3 "Annual Report of the Philippine Tuberculosis Society," 1938.
 - 4 "Annual and Calendar Report of the Philippine Tuberculosis Society from January 1, 1939 to December 31, 1939 and from January 1, 1940 to June 30, 1940."
 - 5 "A Pamphlet about Tuberculosis prepared by Dr. Jose Guidote, Director of the Bureau of Health," Manila, 1945.
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The Need for Tuberculosis Committees in County Medical Societies*

HOWARD E. SMITH, M.D., F.C.C.P.**

Austin, Texas

I have been requested to present some of the arguments for the appointment of a Tuberculosis Committee in each County Medical Society. In a general sense I cannot think of any disadvantages of a committee of this type unless it be that in certain counties, particularly some of those in the Texas Panhandle that the tuberculosis problem be so small as to provide no functions for the committee. Therefore it would be obvious that my recommendations will be entirely for these committees.

The tuberculosis problem in Texas is a major one and in many sections of the State it will surmount all other health problems in the community. The problem will vary from county to county and necessarily control measures should be operated in an uneven manner. Special emphasis should be given those areas where the disease, tuberculosis, has an unusual incidence. In general, the county tuberculosis committee should act in a liaison capacity between all official and non official agencies interested in tuberculosis control and the local county medical society. The need for an official committee has been brought to my attention today in the following manner. In a certain county of the State the local school board in one of the towns has passed a measure requiring the tuberculin testing of all school children in the public school system. The rule passed by the local board seems quite dogmatic in that it requires a physician's certificate, on each individual found to have evidence of tuberculosis, stating that the individual is not infectious before the pupil will be readmitted to the public school. It would seem to me that if this local school board were contemplating passing such a regulation in the school system and if a committee on tuberculosis were present in the local county medical society, the committee could have been requested by the school board to meet with them and discuss the various angles to this type of medical program. The testing program was made mandatory. It should not be mandatory unless facilities are present to provide the proper examination, including an x-ray of the

*Read before the Texas Chapter, American College of Chest Physicians, State Medical Association of Texas, Dallas, May 5, 1947.

**Director, Tuberculosis Control, State Health Department, Austin, Texas.

positive reactors even though they are unable to pay for the examination. Otherwise the regulation is unfair. The school board is to be commended for recognizing the need for a tuberculosis program but from the type of regulation passed it would seem that there was inadequate understanding of the meaning and significance of the tuberculin test and the means necessary to determine if the child is infectious. In my experience few children in such a program will be found to be of any danger to the contacts. As a result, if complete examinations are not available, all that can be determined from the testing program is the incidence of positive reactors in the community. No worthwhile information for a control program will be obtained. The by-products of this type of unsatisfactory control program usually result in confusion of the people, especially the parents, and unnecessary time consumed by the local physicians in explaining the significance of the test. In some communities this type of poorly planned program has resulted in absolute resistance to future bonafide and well planned programs and has delayed a satisfactory program for months or even years in some areas. Thus, there is definite need in my opinion for local committees familiar with tuberculosis that are in a position to offer medical advice and leadership on medical programs where the initiative is taken by lay groups.

A local county medical society tuberculosis committee can provide a service to its own profession. At the present time with the stimulation of tuberculosis control programs by official and non official agencies of the State many counties desire these case finding services, yet in instances to my knowledge the case finding program involving mass surveys of large segments of the population has been broached before the county medical society and voted down through the lack of understanding of the program or the benefits that would accrue to the local physicians and this is especially true of financial gain. At the meeting of the society a discussion takes place and usually some physician with the best of intentions objects on the basis that it leads to State medicine. A motion is made before the society objecting to the program. It will be seconded by a member and a needed program of this type may be deferred or delayed months where there is an acute need for it at the earliest opportunity. If a local committee were present and was familiar with the policies of operations together with the plan in the discussion of the contemplated program the remainder of the society members present would see the advantages, the needs pointed out, and the reasons why no objection should be present. No society, to my knowledge has ever objected to a properly planned program of tuberculosis control where the facts and information were available to them. The only criticism that

appears is that from the lack of knowledge of the suggested control program.

A tuberculosis committee of a county medical society might well operate in an additional capacity, to stimulate interest in the local tuberculosis problem and directly or indirectly to provide for discussions and talks involving the phases of education, diagnosis, treatment and hospitalization of the disease. Since any tuberculosis program must eventually operate on the local level and the family physician must assume some responsibility for the care of the patient at some time during the course of the disease, the local physician becomes an important factor in any tuberculosis control movement. If the patient's physician has no interest in the disease and has not followed the developments in the medical and surgical treatments that have evolved in the last decade, the patient loses interest in the physician and feels that in some instances he is without guidance. With the demonstration of interest in the disease and in the patient, the patient will usually have confidence in his physician and with a little encouragement follow the directions and care suggested by the physician.

Through a study of the problem by the tuberculosis committee the needs of the community can be better planned and coordinated. Texas at this time has an acute shortage of sanatorium beds for the treatment of tuberculosis. It thus becomes mandatory that many cases be treated on the local level and as ambulatory cases. Until the bed shortage is reduced or eliminated and as long as this condition exists there will be need for local tuberculosis clinics. There are a number of counties in the State of Texas where no physician is available for example, to provide pneumothorax refills for the patients. This is a handicap to the treatment regime operated in the State Sanatoria because the medical staff cannot initiate the pneumothorax if at the time the patient leaves the sanatorium it will not be possible for the patient to continue treatments. In some sections of Texas in order for a patient to receive a pneumothorax refill he has to travel one hundred or more miles. To the indigent patient this precludes this type of treatment. In many instances it forces the sanatorium to resort to other measures not so effective in the control of the disease for the particular patient. In other words, we are defeating our purpose and the full benefits of the sanatorium care cannot be applied to all patients needing special treatment and admitted to the institution.

If tuberculosis committees were available in each county medical society worthwhile information on a general level or for the local community could be channelled from the various official and non official agencies of the State, and in turn the committee

might easily bring these matters to the attention of the medical society. The results from a well informed and industrious committee if present in each county, would lead to a closely woven and well coordinated tuberculosis program throughout the entire State of Texas. Control measures would be more readily understood and balanced. Much of the effort now expended in many counties is useless and futile. Tuberculosis testing programs in the school systems might be avoided and the resources for the control of the disease might be channelled into productive effort. Where local means are available the proper segments of the population should be examined where the disease is known to have a higher incidence or those segments of the population where occupational hazards are recognized so that all productive efforts could be coordinated and the instituted case finding measures would supply the most number of unrecognized cases of the disease at the lowest cost per unit case.

With the stimulation of interest in the tuberculosis movement in any community, the usual procedure is to request first services involving the school population because of the ease with which they can be reached. After a study of tuberculin testing programs and case finding programs that have been provided in the school systems of Texas over the past few years we now realize that tuberculosis as a disease is not an important problem in Texas among school children. Usually a school child showing evidence of infection has obtained the infection from an immediate family contact. If the contact is recognized and treated together with proper precautions to prevent its spread, the child with the original positive tuberculin test will usually enjoy good health. We have lost sight of the fact that the most important thing among children is the search for the original source of infection and its recognition. When the school testing program is completed, here we stop and instead of going into the family and finding the original case we simply miss the boat. In other words we are more interested in doing 500 or 1,000 tests in a school system, and seldom figure the cost of the testing program and the time involved in relation to the discovered cases. School programs are expensive methods of finding tuberculosis. Tuberculosis is primarily a disease of adults and the spread of the disease occurs from the adult to the child; therefore our efforts should be directed toward the examination of the adult population of Texas rather than the school population of the State.

As a public health worker my contact with local county medical societies leads me to feel that sometimes I am under suspicion as one of the promoters of State medicine. This is a far cry from the actual facts and our duties. Every effort is made by the state

health department to limit their activities to the field of prevention of diseases. In the case of tuberculosis with the heavy expense and costly equipment involved, it is frequently necessary to supplement case finding measures and in this case the health department does enter into the diagnostic field. In no instance does the health department do any direct treatment of cases of tuberculosis but merely supplements the machinery on the local level and upon local request for this additional service. If a tuberculosis committee were present in the county medical society preliminary discussions of the program might well occur with this committee. The committee in turn would approach the county medical society. I firmly believe this society would have more confidence in the recommendations of some of their fellow physicians. The committee, thus in turn would remove the stigma of socialized medicine from the state health department. Where the local committee would function in its proper capacity it would practically eliminate the necessity for contact directly with the local county medical society and would lend support to the idea that all programs involving the health of the people would be the responsibility and under the complete control of the local county medical society. It is under the present plan, but at least it would remove some of the objections that we frequently confront when we are facetiously referred to as trying to sell the local county society a "bill of goods."

In summary the advantages of a local tuberculosis committee of the county medical society might be said to consist of a direct educational value to the people of the county and to the local medical profession. A well coordinated program of control could be formulated. A more complete picture of the problem and the needs might be presented to the public and to the medical profession. Through the liaison activities of the committee much of the suspicion of official and non official agencies can be removed toward the motives of suggested programs for the local benefit. An interest by a few physicians in each county will eventually lead to a more affective and complete tuberculosis control program on a local level. The committee as a whole would be benefited, the victims of the disease would receive better treatment and the medical profession in general would develop an awareness of the disease, and the modern concepts of control of the disease.

Letter from the Republic of Panama

TREATMENT OF BRONCHIECTASIS AND OF BRONCHIAL SUPPURATIONS BY INTRATRACHEAL INJECTIONS OF PENICILLIN

For some time in our Medical Service, all cases of bronchiectasis have been treated by intratracheal injections of penicillin. Our technique is so simple that we believe it may be of interest to present it.

The patient is put on a table, the head extending beyond it and is held in slight hyperextension by an assistant. With a 20 or 22 gauge hyperdermic needle, the cricothyroid membrane is punctured and 3 cc. of a 5 per cent solution of cocaine are injected slowly. This injection must not be finished in less than three minutes so as to allow complete anesthetization of the trachea and bronchi. A complete anesthesia is obtained when the patient indicates an indefinite sensation in the throat.

Penicillin is then injected through the same puncture needle. The penicillin solution contains 100,000 units in 5 cc. of distilled water. When there is a bilateral bronchiectasis, we inject 5 cc. of this solution into each bronchial tree. If unilateral bronchiectasis is present, only the diseased portion is treated.

The position of the patient depends upon the localization of the process. Usually it takes half a minute to inject the five cc. portion. We have employed this technique more than a hundred times. All of the patients have tolerated them perfectly. Many of them have not coughed for hours after the injection and always have walked back to their wards, with the exception of too sick cases. Postural drainage is used for several days before the injection.

After the first injection, the sputum becomes more liquid and is reduced in amount. Fever, foul odor of the sputum and all toxic phenomena also disappear. The appetite returns and there is a general improvement in the condition of the patient.

We believe that our technique can be of great help in the preparation of the patient for lobectomy although it does not exclude the inhalation of nebulized solutions of penicillin. On the contrary, both methods complement each other.

Hernandez Loeches, M.D., Chief of Medicine,
Hospital de David, Rep. de Panama.

Annual Meeting, Executive Council

The members of the Executive Council of the College met at the Ambassador Hotel, Atlantic City, Thursday morning, June 5, 1947. The reports of the standing councils and special committees were reviewed and approved. These reports were presented before the general assembly on Friday, June 6, and are published in this issue of the journal.

Annual Meeting, Board of Regents

The Board of Regents of the College met in annual session at the Ambassador Hotel, Atlantic City, Thursday afternoon, June 5, 1947. The meeting was called to order by Dr. Joseph C. Placak, Chairman of the Board of Regents. The following members of the Board registered for the meeting:

Joseph C. Placak, M.D., Cleveland, Ohio, Chairman
Donato G. Alarcon, M.D., Mexico City, Mexico
Andrew L. Banyai, M.D., Milwaukee, Wisconsin
Robert K. Campbell, M.D., Springfield, Illinois
Dean B. Cole, M.D., Richmond, Virginia
Edward W. Hayes, M.D., Monrovia, California
Charles M. Hendricks, M.D., El Paso, Texas
William A. Hudson, M.D., Detroit, Michigan
Chevalier L. Jackson, M.D., Philadelphia, Pennsylvania (alternate)
Minas Joannides, M.D., Chicago, Illinois
Major General S. U. Marietta, Washington, D. C.
Louis Mark, M.D., Columbus, Ohio
Jay Arthur Myers, M.D., Minneapolis, Minnesota
William E. Ogden, M.D., Toronto, Canada
Richard H. Overholt, M.D., Brookline, Massachusetts
J. Winthrop Peabody, M.D., Washington, D. C.
Karl Schaffle, M.D., Asheville, North Carolina
A. J. Steiner, M.D., St. Louis, Missouri (alternate)
Moses J. Stone, M.D., Boston, Massachusetts
Nelson W. Strohm, M.D., Buffalo, New York
James H. Stygall, M.D., Indianapolis, Indiana
Paul A. Turner, M.D., Louisville, Kentucky
Harry C. Warren, M.D., San Francisco, California

Murray Kornfeld, Chicago, Illinois, Executive Secretary
Harriet E. Lumm, Chicago, Illinois, Assistant to the Executive Secy.

The Secretary-Treasurer of the College presented his report as follows:

Report of the Secretary-Treasurer

The following is a summary of the Financial Report for the fiscal year ended April 30, 1947 (LaSalle Audit Company, Chicago):

BANK BALANCE, May 1, 1946	\$30,843.69	
Cash Receipts, May 1, 1946 to April 30, 1947	60,414.06	
TOTAL CASH AVAILABLE		\$91,257.75
Disbursements, May 1, 1946 to April 30, 1947		44,314.96
BANK BALANCE, APRIL 30, 1947		
General Fund	\$36,877.29	
Endowment Fund	750.00	
Life Membership Fund	2,085.00	
Research Council Fund	7,230.00	\$46,942.79

BALANCE SHEET — APRIL 30, 1947

A S S E T S

ENDOWMENT FUND:

Cash in First National Bank of Chicago	\$ 750.00	
United States Savings Bonds—Series G	10,000.00	
TOTAL ENDOWMENT FUND		\$10,750.00

LIFE MEMBERSHIP FUND:

Cash in First National Bank of Chicago	\$ 2,085.00	
United States Savings Bonds—Series G	1,300.00	
TOTAL LIFE MEMBERSHIP FUND		\$ 3,385.00

RESEARCH COUNCIL FUND:

Cash in First National Bank of Chicago	7,230.50	
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GENERAL FUND:

Cash in First National Bank of Chicago	\$36,877.29	
Cash on Hand	25.00	
United States Savings Bonds—Series G	10,000.00	
Accounts Receivable	981.97	
Furniture and Fixtures (at Cost)	2,056.60	
Prepaid Expense (Convention Badges)	363.46	
Deposits — Airlines	675.00	
TOTAL GENERAL FUND		\$50,979.32

TOTAL ASSETS

\$72,344.82

LIABILITIES AND SURPLUS

LIABILITIES:

Collections toward Fellowships	\$ 6,355.00	
Fellowship Fees Collected (Pending Examination)	6,350.00	
Special Fund	4,619.00	
Publications Fund	2,887.32	
Chapter Funds	440.00	
Miscellaneous Liabilities	227.84	
TOTAL LIABILITIES		\$20,879.16

SURPLUS:

Endowment Fund Surplus	\$10,750.00
Life Membership Fund Surplus	3,385.00
Research Council Fund Surplus	7,230.00
General Fund Surplus	30,100.16

TOTAL SURPLUS

51,465.66

TOTAL LIABILITIES AND SURPLUS

\$72,344.82

The College operated during the fiscal year ended April 30, 1947, on a budget of \$36,530.00. Total expended was \$36,781.84, which was \$251.84 above the budget allowed. Expenditures approved by the Board of Regents during the year, and not budgeted, amounted to \$6,572.29. For the current fiscal year, starting May 1, 1947, and ending April 30, 1948, a budget has been approved by the Executive Council in the amount of \$41,350.00.

Minas Joannides, M.D., *Secretary-Treasurer*.

The following councils and committees then presented their reports:

Report of the Membership Committee

As of June 1, 1947, there were 2272 members in the College, and there were 80 applications for membership pending investigation. This is an increase of 305 new members during the past year. Of the 2272 members, 1652 are Fellows, 125 Associate Fellows and 495 Associate Members.

During the past year, we have added 177 new Fellows to our roster, 5 new Associate Fellows, and 123 new Associate Members.

Below we have listed the College membership by countries, which shows that we have members in 37 countries other than the United States and its possessions.

The United States of America 1682

Possessions:

Alaska	4	
Canal Zone	2	
Hawaii	18	
Puerto Rico	35	59

Other Countries:

Argentina	67	Italy	1
Australia	21	Jamaica	1
Belgium	16	Jugoslavia	1
Bolivia	6	Lebanon	2
Brazil	73	Mexico	39
Canada	75	New Zealand	1
Chile	51	Nicaragua	1
China	5	Norway	1
Colombia	10	Paraguay	3
Costa Rica	7	Peru	22
Cuba	25	Philippines	9
Dom. Rep.	2	Portugal	1
Ecuador	8	Rep. of Panama	9
El Salvador	3	South Africa	16
England	1	Sweden	1

Greece	14	Switzerland	3
Guatemala	3	Uruguay	6
Haiti	3	Venezuela	22
India	2		—
			531

TOTAL MEMBERSHIP

2272

Roy A. Wolford, M.D., *Chairman*.

Report of the Committee on Public Relations

The Committee on Public Relations of the American College of Chest Physicians has confined its program to obtaining mention of College activities in recognized state, national, and foreign medical journals. During the past year, ending June 1, 1947, articles appeared which related to College activities in the following journals:

State Medical Journals	36 notices
Journal of the American Medical Association	4 notices
Other national medical journals	9 notices
Foreign medical journals	4 notices
TOTAL	52 notices

In addition, many of the scientific programs of the College Chapters were published in the official programs of the state and district medical societies, as well as publicized in the state and district medical journals. No doubt, other mentions were made of College activities which have not come to our attention.

John Roberts Phillips, M.D., *Chairman*.

Report of the Scientific Program Committee

The Scientific Program Committee has undertaken its task with the full appreciation of its serious responsibility. We had to live up to the shining examples of our predecessors and at the same time, fulfill the anticipation of the scientific interest of the Fellowship in modern issues, in recent accomplishments of medical research and in competent evaluation of controversial clinical problems. We have endeavored to assemble speakers whose qualities as clinicians, research workers, teachers and public health organizers have the hallmark of competency and superior knowledge.

The arrangement of the program has been such that due space and time has been allotted for the discussion of various epidemiologic and clinical aspects of tuberculosis. The array of various medical and surgical treatment measures includes the oldest method, bed rest and the newest one, streptomycin. Between these two extremes, representative speakers have been assigned to critical and analytical reviews of such items as pneumothorax, artificial pneumoperitoneum, extrapleural pneumothorax, thoracoplasty, lobectomy and pneumonectomy. From a glance at the program, it is evident that we have succeeded in establishing a wholesome balance between medical and surgical topics dealing with tuberculosis.

No less emphasis has been given to subjects which cover certain aspects of differential diagnosis, encompassing the gastrointestinal tract and cardiology. One of the newest departures in the latter is angiocardiology; therefore, its presentation was thought to carry an appeal to all interested in chest diseases.

It would be too lengthy to enumerate all of the other subjects included in the scientific program. Suffice it to say that we have tried to focus the attention of the audience on a great assortment of scientific problems, each of which is of importance in the practice of the chest physician.

On account of the magnitude of the scientific program, we have been obliged to select only one discussant for subjects presented on the first day. For the discussion of all of the other presentations, two discussants were secured. We wish to point out that while several outstanding authorities have been invited to speak at the meeting who are not Fellows of the College, we insisted on offering places as discussants to members only. In this manner we expected to obtain the benefit of "extramural" knowledge as well as a cross section of the scientific thinking of the Fellows of the College.

Previous technical policies of the annual meeting have been adhered to in that each speaker is limited to twenty minutes, with the exception of very few lengthy subjects. Discussions are limited to five minutes. Each subject is open for discussion from the floor, following the talks of the discussants invited. All presentations are closed by a five minute summary by the speaker.

The set-up of the program is such that despite its high scientific standards, various geographic segments of the country are well represented. As a matter of fact, we have speakers not only from the Atlantic to the Pacific and from the Gulf of Mexico to our Northern boundaries, but also from Canada and from England.

The list of participants in the scientific program has a truly international character. Nothing is more expressive of the vast sphere of the College as a scientific body than the program arranged under the auspices of the International Night. Fellows of the College are gathering here from Mexico, Cuba, Argentina, Paraguay, from Switzerland, Yugoslavia, Australia, the Philippine Islands and from China. What a splendid manifestation of human, medical and scientific harmony and solidarity. A distance of ten thousand miles is no short span to travel for the sake of a meeting, as it has been done by some of our distinguished Fellows. But, evidently, the lofty purposes, great accomplishments and ambitious ideals of the American College of Chest Physicians make the distance disappear and unite the Fellowship of this organization in a common endeavor for greater and better service through science to humanity. It may be disclosed at this time that only unsurmountable technical difficulties, not distance, have prevented some of our Fellows from being at the annual convention, Fellows from Norway, Belgium, France, Portugal, Italy, Greece and from a number of other countries.

An evening session with the Panel of Experts on the program has become by now a cherished traditional event. It is with pride and satisfaction to point out the prominent scientific and teaching background of each and every one of the men called upon to serve on this panel. This session has developed into a most potent source of up-to-the-minute information. It is an open forum where Fellows of the College

may bring their unsolved problems pertaining to Medicine, Surgery, Bronchoesophagology, Roentgenology and Pathology. Nuggets of new knowledge and gems of medical wisdom are given away for the asking. Truly, it is a miniature post-graduate course on distinguished scientific level. That is why it is not surprising to see an avalanche of questions pouring in from all over the country. Questions and answers given at this session are published in the College journal, "Diseases of the Chest," for the edification of those who were unable to attend.

The scientific transactions culminate in and end with an X-Ray Conference. During this session, interesting and unusual cases are presented in each of which a definite diagnosis has been established by examination of a surgical-pathological specimen, bronchoscopic examination, post-mortem examination or by laboratory data. Slides are prepared of the x-ray films and projected on a large screen so that they are easily visible to the entire audience. Simultaneously with the showing of the slides, a five minute summary of the history, physical findings, significant laboratory work, surgical findings or of the necropsy is given by the contributor. A mimeographed resume of the findings in each case is made available for the perusal of the audience.

The members of the Scientific Program Committee will look upon your endorsement of our efforts and upon the anticipated large attendance at the scientific sessions as our most cherished reward.

Respectfully submitted to the Board of Regents by the Scientific Program Committee.

Andrew L. Banyai, M.D., *Chairman.*

Report of the Council on Undergraduate Medical Education

The Council on Undergraduate Medical Education, during the past year, has devoted its time and efforts principally to the preparation of the text book on Tuberculosis, which is sponsored by the American College of Chest Physicians.

The material for this book, with the exception of the chapter on Pathology, the preparation of which has been delayed by illness, is now in the hands of the publisher, The Charles C. Thomas Company of Springfield, Illinois.

The publishing company have advised us that they will make every effort to have the book published as soon as possible and it is our hope that this will be done before the opening of medical schools next September.

Your Council plans now to contact medical teachers and medical schools throughout the United States and Canada and call their attention to this book and urge, that as far as possible, it be placed in the hands of all medical students and medical teachers.

This Council solicits the aid of the various units of the College and their officers in this work. We are particularly anxious to have the officers and representatives of the College who are in a position to have personal contact with medical schools and those in charge of the department of chronic diseases of the lungs use their influence in promoting the distribution of this book. It is felt that personal contact, particularly by those who are known to the medical schools, will be a more valuable factor in this work.

Edward W. Hayes, M.D., *Chairman.*

Report of the Council on Postgraduate Medical Education

The Council on Postgraduate Medical Education reported that plans were discussed for continuing postgraduate medical education in diseases of the chest and it was announced that the next course would be given in Chicago, September 15-20. Dr. Edwin R. Levine, a member of the Council on Postgraduate Medical Education and Chairman of the Medical Education Committee of the Illinois Chapter of the College, was authorized to proceed with the arrangements for this course.

A complete report of the Council will be published in a future issue of the journal.

J. Winthrop Peabody, M.D., *Chairman.*

Report of the Council on Public Health

At the annual meeting in San Francisco, 1946, the name of this Council was changed from "The Council on Military Affairs and Public Health" to "The Council on Public Health." The former Council under the able guidance of Dr. Charles Hendricks did splendid work during the war years and was of especial aid to the services in bringing about the x-raying of all inductees. Now that this policy has been established and because the war is over, it was felt best to discontinue the efforts of the Council in regard to military affairs. A short time elapsed before the Council membership was completed and it now consists of the following members:

Paul A. Turner, M.D., Louisville, Kentucky, Chairman
Sidney A. Britten, Comdr., M.C., U.S.N., Washington, D. C.
Richard Davison, M.D., Chicago, Illinois
John B. Grow, Col., M.C., U.S.A., Denver, Colorado
W. H. Hatfield, M.D., Vancouver, British Columbia
Herman E. Hilleboe, M.D., Assistant Surgeon General, USPHS,
Washington, D. C.
Samuel E. Thompson, M.D., Kerrville, Texas
Walter E. Vest, M.D., Huntington, West Virginia
Roy A. Wolford, M.D., Veterans Administration, Washington, D. C.

A meeting of the Council was planned in order to determine what should be undertaken for the benefit of the specialty of chest diseases as related to public health. The meeting was held in Washington, D. C., February 27, in the offices of Dr. Herman E. Hilleboe, Assistant Surgeon General, USPHS. Those present were:

Comdr. Sidney A. Britten, M.C., U.S.N.
Dr. Herman E. Hilleboe, Assistant Surgeon General, USPHS
Col. Roy A. Wolford, Veterans Administration
Dr. Walter E. Vest, Huntington, West Virginia
Paul A. Turner, M.D., Louisville, Kentucky, Chairman

By invitation:

Major General S. U. Marietta, President-Elect, ACCP
Dr. J. Winthrop Peabody, Past President, ACCP
Dr. John Barnwell, Chief Tuberculosis Division, Veterans
Administration

The first matter to come before the Council was the election of speakers to appear at the luncheon meeting Friday, June 6, at the annual

meeting in Atlantic City. A general topic of discussion was eventually selected, i.e., "Experiences of the United States Services in the Control of Tuberculosis in World War II as compared with World War I and Plans for the Future." Speakers selected were Dr. Francis J. Weber, Medical Director, Chief of Tuberculosis Control Division, USPHS, Washington, D. C., to speak for the USPHS; Commander Sidney A. Britten, M.C., U.S.N., to speak for the Navy; Colonel Roy A. Wolford, Assistant Chief of Tuberculosis Division, Veterans Administration, to speak for the Veterans Administration; Colonel John B. Grow, Fitzsimmons General Hospital, Denver, to speak for the Army. Dr. John Barnwell, Chief Tuberculosis Division of Veterans Administration, consented to summarize the discussions. These talks are to be limited to ten minutes each.

Through the discussions by these leading authorities, the Council feels that the members of our organization will be benefited by knowing the tremendous strides forward that the various services have made toward the control of tuberculosis, and will be glad to know what is being contemplated in the future to be undertaken for the eradication of tuberculosis. We also hope that there will be time for these speakers to mention any other activities having to do with public health which touch other diseases of the chest.

The Council then undertook to determine how it could function to help the College and other physicians chiefly interested in chest diseases. After considerable discussion it was determined that we should limit our endeavors in public health to those affecting all diseases of the chest, with the exception of heart disease, but with special reference to tuberculosis. We feel that there should be no duplication of effort, if possible, and that problems affecting the heart should be taken care of by the heart organizations.

It was further agreed that no council or committee could properly make any extensive investigation of any one phase of our subject without some full-time personnel and proper financial support. During the discussion of this point several things were mentioned which must have further investigation, and among these streptomycin was mentioned and the recent appropriation of one million dollars for the investigation of this drug. Dr. Hilleboe then discussed at length the present status of tuberculin and the necessity for a tremendous amount of research in regard to the second strengths which have been found to be unsatisfactory. He also discussed B.C.G. and the plans under way for the extensive testing of this preparation, which appears finally to loom as a very effective immunization product. Commander Britten then mentioned some of the investigations contemplated by the Navy. After discussing such things as these and realizing the tremendous amount of time and money which would have to be expended before anything could be accomplished in such investigations, the Council came to the conclusion that it could serve best if it acted as an information bureau where the up-to-date information in regard to all scientific investigations could be procured. It was, therefore, agreed that this Council would endeavor to be an information bureau in regard to matters pertaining to public health as affect diseases of the chest, excluding heart disease and emphasizing tuberculosis. We will be glad to receive questions and problems from any doctor whose interest is chiefly in chest diseases. The Council will then transmit these questions or problems to sources making the investigations in question. Upon receipt of the

information desired it will be given to the doctor who made the request and it will also be sent to all medical journals in this Country and in countries where there are chapters of the College.

We hope to make the above-suggested arrangements with all foundations and scientific investigators. As a start the United States Services have agreed to give us a combined release of up-to-the-minute news every quarter. In turn, of course, the Council agrees to transmit to the various services whatever questions and problems received which have to do with their work. If the Council can effectively function in the manner described, it is hoped that we can broadcast accurate information before the scientific papers can be published in the medical and surgical journals and before inaccurate statements are read in digests which often appear in lay publications.

The Council went on record as favoring at least two meetings each year and agreed to have the next meeting in Atlantic City at the time of the annual meeting of the American College of Chest Physicians. We expressed to Dr. Hilleboe our thanks for the use of his office for this meeting.

Paul A. Turner, M.D., *Chairman.*

Report of the Committee on Diseases of the Chest in Mental and Penal Institutions

Dr. Otto L. Bettag, Pontiac, Illinois, Chairman of the Committee on Diseases of the Chest in Mental and Penal Institutions, read a report of his committee. It was recommended that copies of this report be sent to Commissioners of Mental Health in the various states and to all organizations interested in mental hospitals.

Report of the Committee on Occupational Diseases of the Chest

The Committee on Occupational Diseases of the Chest wishes to report that during the year 1946-1947 many changes in the occupational laws have been made in various states. There still remains many states which do not have occupational disease laws and many states whose laws are quite unsatisfactory as far as the care of the disabled worker is concerned. We are trying, through the various members of the College and members of the committee, to encourage the improvement of laws which now exist in each state for better care and service to the disabled workers.

The task is a great one and quite difficult because of the fact that each state has different problems, but we feel that progress is being made and by continued effort greater uniformity of laws will result.

Louis Mark, M.D., *Chairman.*

Report of the National Council of Tuberculosis Committees

The National Council of Tuberculosis Committees has carried on its program of encouraging the organization of tuberculosis committees in the state and county medical societies since 1938. All but a few states have organized tuberculosis committees. In several of the states, tuberculosis committees have been organized by many of the county medical

societies. Through this extensive organizational program, more and more physicians have become interested in the campaign being waged against tuberculosis.

In this report, we particularly want to commend the Medical Societies of the states of Minnesota and Texas for their cooperation in establishing the machinery necessary to carry out a constructive tuberculosis program. We are pleased to attach to this report, the report of the Committee on Tuberculosis of the Medical Association of Texas as given at the 80th Annual Session of the Society held at Dallas, May 5-8, 1947.

REPORT OF THE COMMITTEE ON TUBERCULOSIS MEDICAL ASSOCIATION OF TEXAS

This committee was reorganized at the suggestion of the Board of Trustees of the State Medical Association, on an overlapping five year term of office basis at the last annual meeting of the Association. The duties of the committee are as follows:

"... It shall be the duty of this committee to give continued study and consideration to the problem of tuberculosis in all of its phases, cooperate with the state health department and constituted health authorities throughout the state in the campaign of prevention and suppression of disease, and promote and direct activities of the State Medical Association of Texas in this connection."

The following objectives of the committee were adopted through correspondence, immediately after the committee had been appointed:

1. To act as a liaison group between the State Health Department (Tuberculosis Section), Texas Tuberculosis Association, and the State Medical Association.
2. To keep in touch with all phases of state and federal efforts in the control of tuberculosis.
3. To work for improvement in the teaching of tuberculosis and all diseases of the chest in our medical colleges.
4. To assist in arranging for more internships in our tuberculosis hospitals.
5. To lend assistance to a movement for training schools for Negro nurses in our State Sanatorium for Negroes.
6. To encourage general hospitals to complete chest x-rays on each patient upon admission as a routine procedure.
7. To continue to encourage mass x-ray surveys of all industries, mercantile companies, schools, colleges, and eleemosynary institutions.
8. To lend support to legislation that would provide an adequate number of tuberculosis beds to meet the tuberculosis situation in Texas.
9. To assist in a drive toward the isolation of each open case of tuberculosis.
10. To further the cause of rehabilitation of all tuberculous patients.
11. To assist in any effort toward the improvement of the standards of administration of all state tuberculosis hospitals.
12. To assist in the improvement of the medical and surgical treatment of tuberculosis in our state sanatoria.
13. To endeavor to have a strong tuberculosis committee in each county medical society of the state, the duty of the county com-

mittee to keep in close touch with local health authorities on all phases of tuberculosis control.

14. To meet from time to time with the medical section of the state health department and the Texas Tuberculosis Association.
15. To seek the cooperation of the Texas Tuberculosis Association, the State Health Department (Tuberculosis Section), and the State Medical Association, in the exchange of information concerning the state tuberculosis problem, in order that the efforts of each may be coordinated.

The Committee decided to hold its meetings in Austin, at the time that the Board of Directors of the Texas Tuberculosis Association holds its meetings. It was also decided to invite the Executive Committee of the Texas Tuberculosis Association and the Tuberculosis Control Officer of the State Health Department, to meet with our committee for the discussion of all problems of tuberculosis control, its treatment, and the rehabilitation problems of the state of Texas. We are happy to report that the suggestion was agreeable to all concerned, as in no other way could the exchange of information and the coordination of the efforts of the organizations concerned be accomplished.

The first meeting of the Committee on Tuberculosis and the Executive Committee of the Texas Tuberculosis Association was held December 15, 1946, with all members of both organizations present, including Dr. Howard E. Smith, Tuberculosis Control Officer of the State Health Department. All of the objectives of the committee were discussed, including the proposed training school for Negro nurses at the state sanatorium at Kerrville. It was agreed that a committee be appointed to investigate the sanatorium at Kerrville, the committee to be a joint committee of the Committee on Tuberculosis and the Executive Committee of the Texas Tuberculosis Association.

It was agreed to support the bill now pending in the State Legislature to provide two district sanatoria. It was also agreed that after these bills shall have passed and the new sanatoria established, new legislation would be sought which would correct all obsolete provisions now in force in our state institutions.

It was decided to invite each county medical society to appoint a committee on tuberculosis.

It was also agreed that there would be a mutual exchange of information between the Committee on Tuberculosis of the State Medical Association and the Texas Tuberculosis Association, and the Executive Secretary of the State Medical Association.

The second meeting was held March 16, 1947. In addition to those present at the first meeting, Dr. Robert J. Anderson of the United States Public Health Service was present by invitation.

The report of the committee to investigate conditions at the state sanatorium at Kerrville was discussed. This report was presented to the chairman of the Board of Control with the request that the Board of Control inform the committee what steps would be taken in correcting the deplorable conditions found to exist at this state institution.

Analysis of Tuberculosis Situation in Texas

There are approximately 3,000 deaths from tuberculosis in the state of Texas annually; 68 per cent of the total deaths in the state occur outside of any institution. Approximately 2,000 beds are available for

the average citizen of the state. There is evidence of bed wastage in all state sanatoria, so far as tuberculosis control is concerned. Many patients with non-infectious disease are being hospitalized while those with open cases, somewhat advanced, are being refused admission. There are no surgical facilities at either of the state supported sanatoria. There is no surgical room whatsoever at the Negro sanatorium at Kerrville. This condition exists in spite of all the progress in bronchoscopy and thoracic surgery in the past ten years.

Out of the 2,000 beds mentioned, only 1,150 are provided by the state, and 650 by various city and county institutions. As the case finding develops, the case load will be tremendously increased; however, if the establishment of the two proposed sanatoria is accomplished, the case load will be much reduced. One of the most important essentials in a tuberculosis program is financial aid to the bread winners who become incapacitated from tuberculosis. Texas has given little or no attention to this problem. Case finding programs in other parts of the country and in government service, have shown tuberculosis rates to be highest among domestics. Since domestic servants in Texas come mainly from the Latin American and Negro classes, greater efforts toward the control of the disease in these two groups is imperative. In analyzing the tuberculosis situation in Texas, any further progress to be made depends upon appropriations for more beds, the use of available beds to be confined to open cases for isolation purposes, the establishment of surgical facilities at all state sanatoria, physical examination of all domestics and food handlers, adequate laws governing the isolation of open cases, and increasing the interest of each physician in the state toward the tuberculosis problem.

The case finding program in Texas is progressing as rapidly as photographic units and technical assistants are obtained. Case findings in eleemosynary institutions will be begun soon. The x-ray examination of chests of all patients admitted to general hospitals has barely begun. It is our hope that within the next few months this program will be adopted throughout the state.

The question of vaccination against tuberculosis was discussed by Dr. Anderson of the United States Public Health Service, who stated that vaccinations by this service would probably be begun in Columbus, Georgia. It was learned from the State Tuberculosis Control Section that arrangements were being made to request that the BCG vaccine program be instituted in Texas, probably in Hidalgo County.

It was found that the measures providing for the establishment of two district sanatoria in Texas, which were being prepared for introduction in our State Legislature, were being held in abeyance pending the outcome of negotiations for securing Moore Field at Mission and Camp Fannin at Tyler from the War Surplus Administration, to be turned over to the Board of Control and converted into sanatoria for tuberculosis.

Letters have gone from the Committee on Tuberculosis to presidents of county medical societies in the state, requesting them to appoint committees on tuberculosis. Many such committees have been appointed.

After studying the reports from medical schools of Texas, as to the number of hours devoted to the teaching of tuberculosis, it was agreed that the program for teaching tuberculosis should be greatly expanded.

Recommendations

We recommend that provisions for chest surgery be made at the earliest possible date at each of the state sanatoria now in existence and to be established in the future. The members of this committee, together with physicians who are members of the Board of Directors of the Texas Tuberculosis Association, are positively opposed to the transportation of tuberculosis patients to Galveston for thoracoplasties. They do not object to the procedure during the present emergency, but that they are against it as a long range practice. We recommend the acceptance of the proposal by the United States Public Health Service to furnish, free of charge, a thoracic surgeon for two years, this surgeon to be maintained at one or the other of the state sanatoria and perform all surgical operations which are indicated on any and all state patients with tuberculosis.

We recommend legislation which will correct all obsolete provisions of our state laws governing tuberculosis sanatoria.

We recommend that, unless conditions now existing at the State Sanatorium for Negroes at Kerrville are improved at an early date, the institution be closed for the good of all concerned.

We recommend that the State Medical Association Committee on Tuberculosis be an official advisory board to the State Board of Control, and to the medical superintendents of all state tuberculosis sanatoria. The committee should be sanctioned by law in order to be effective.

We respectfully request the Board of Trustees of the State Medical Association to set up a fund to reimburse members of this committee, for their actual expenses in attending its meetings, only those members of the committee who are not also members of the Board of Directors of the Texas Tuberculosis Association to be eligible for reimbursement. This fund should also be sufficient to reimburse members of the committee who are required to attend any special meetings, such as the inspection of institutions or sites for institutions. The fund should also provide stationery, postage, mimeographing and printing that the committee may require to circularize county medical societies throughout the state.

Respectfully submitted,

C. M. Hendricks, M.D., Chairman,
Charles J. Koerth, M.D.,
David McCullough, M.D.,
Howard T. Barkley, M.D.,
Jesse B. White, M.D.

Our Council also wishes to commend Dr. Howard E. Smith, Director of Tuberculosis Control, State Health Department, Austin, Texas, whose interesting article on "The Need for Tuberculosis Committees in County Medical Societies" appears in this issue of our journal.

The Tuberculosis Committee of the Minnesota State Medical Society arranged for a special program on diseases of the chest in connection with its annual meeting held in Duluth, Minnesota on July 1. This session was attended by a large number of physicians in the general practice of medicine and all of the papers were well received.

The National Council of Tuberculosis Committees has sponsored luncheon meetings at the past two Annual Meetings of the College and

we are pleased to report that there is a great amount of interest shown in these meetings.

Our Council would like to receive the reports of the tuberculosis committees of the other state medical societies.

James H. Stygall, M.D., Indianapolis, Indiana, Chairman,
James F. Brewer, M.D., New Bedford, Massachusetts,
Maurice Campagna, M.D., New Orleans, Louisiana,
Cole B. Gibson, M.D., Meriden, Connecticut,
D. W. Heusinkveld, M.D., Cincinnati, Ohio,
John S. Packard, M.D., Allenwood, Pennsylvania,
Rufus A. Schneiders, M.D., San Diego, California,
Nelson W. Strohm, M.D., Buffalo, New York,
Darrell H. Trumpe, M.D., Springfield, Illinois.

Dr. William E. Ogden, Regent of the College for Canada, gave a report regarding the increase in College membership in Canada. Dr. Ogden stated that everything was being done in Canada to uphold the high standards for membership in the College in that country.

Dr. Charles M. Hendricks made a report regarding the efforts of the College to establish a section on diseases of the chest in the American Medical Association. He presented the following resolution which was unanimously adopted:

WHEREAS, A resolution to establish a Section on Diseases of the Chest will be introduced before the House of Delegates of the American Medical Association meeting in Atlantic City, New Jersey, June 9-13, 1947, and

WHEREAS, In accordance with the prescribed procedure of the House of Delegates of the American Medical Association this resolution will be referred to a Reference Committee,

THEREFORE, BE IT RESOLVED, That a committee of three or more members of the College be appointed by the President to appear before the Reference Committee of the American Medical Association to present the arguments in favor of the establishment of such a section in the American Medical Association.

The following committee was appointed to meet with the Reference Committee on Sections and Section Work of the American Medical Association:

Charles M. Hendricks, M.D.
Major General S. U. Marietta
J. Winthrop Peabody, M.D.

Report of the Committee on the Management and Treatment of Diseases of the Chest

Dr. Edwin R. Levine, Chicago, Illinois, Chairman of the Committee on the Management and Treatment of Diseases of the Chest, and Dr. Karl H. Pfuetze, Cannon Falls, Minnesota, Chairman of the Committee on Chemotherapy and Antibiotics, presented their reports to the Board of Regents. These reports will be published in a later issue of "Diseases of the Chest." The Committee on Chemotherapy and Antibiotics was

authorized to release a statement to the press on the value of streptomycin in the treatment of tuberculosis and other chest diseases. It was further recommended that Dr. Pfuetze's report on streptomycin be given before the general assembly of the College.

Report of the Committee on State Laws for Tuberculosis

On previous occasions, it has been our honor and privilege to call to the attention of the Board of Regents and of the Fellowship of the College that a complete collection of State Laws for Tuberculosis has been gathered by this Committee and is available, through the office of the Executive Secretary, for the perusal by all interested in this subject. At this time, we wish to give a summary of changes which have taken place in tuberculosis control activities in the various States during 1945 and 1946, together with other data which have a bearing on legislative and public health efforts focused on the eradication of this disease. Some of the States reported no relevant changes.

Although not all the information we intended to collect has reached us at the time of completion of this report, we are confident that through the excellent cooperation this Committee has been receiving from the various State Health Departments, in general and from the Tuberculosis Controllers, in particular, our files covering pertinent State Legislation can be maintained accurately and up-to-date as heretofore.

ARIZONA

Gerald R. Clark, M.D., Director, Division of Tuberculosis Control, Arizona State Department of Health, reports on two changes that have taken place in the last two years. In the summer of 1945, tuberculosis was included in Regulation 3 of the "Rules and Regulations of the State Department of Health for the Control of Communicable Diseases." Thus, tuberculosis has become subject of definite control measures. These include the following paragraph: "When a health officer has reasonable grounds to believe that a person or persons may have been exposed to a communicable disease, he may control them as known contacts, making such examinations and adopting such measures as he deems necessary and proper for the protection of the public health and the prevention of the spreading of the disease." Evidently, the regulations permit the isolation of the patient with positive sputum and also, the use of the tuberculin test and the taking of chest roentgenograms in all contacts.

The 18th Arizona Legislature which adjourned in 1947 passed a bill (House bill 166) which transfers the State Tuberculosis Sanatorium from the State Board of Social Security and Welfare to the supervision of the State Department of Health. This implies that the latter is planning to undertake a program of enlarging the institution which at the present time has only 94 beds and to improve the quality of services now offered by this institution.

There has been an intensive tuberculosis case finding program in effect since the spring of 1945. It is hoped that it will serve a double purpose. (1) It solves the most pressing health problem of the State. (2) It gives an incentive to legislative endeavors for the enlargement of the only tuberculosis institution of the State.

The State mass x-ray survey program was slow in starting, but it

picked up impetus after intensive publicity by the Division of Tuberculosis Control and by the Anti-Tuberculosis Association. Up to March 1947, 130,000 have been x-rayed once, with a number of communities not yet covered. During the same period, reporting of cases by agencies and private physicians has improved considerably and the only two organized County Health Units have expanded their tuberculosis program.

The matter of getting funds for constructing an addition to the present sanatorium will be brought up again at the next Special Session of the State Legislature.

CONNECTICUT

In Connecticut, the control of tuberculosis is divided between two state agencies. The State Department of Health has the function of collecting information concerning morbidity and working cooperatively with the local health officer in an early discovery campaign. The State Tuberculosis Commission, on the other hand, has control of the sanatoriums and also are carrying out a case finding program in those areas not covered by the local departments of health. According to the report of Eugene E. Lamoureux, M.D., Director, Bureau of Preventable Diseases, through the cooperative efforts on the parts of both agencies, a very good tuberculosis control program has been established in Connecticut.

During 1945-46, a new law was enacted for the purpose of dealing with the recalcitrant tuberculous patient: "When it comes to the attention of a town, city or borough health officer or board of health of any city or borough that any person is afflicted with tuberculosis and is a carrier of such disease, and is unable or unwilling to conduct himself and to live in such manner as not to expose to danger of infection members of his family or household or other persons with whom he is associated, the health officer or board of health shall forthwith investigate the circumstances alleged. If such health officer or board of health finds that any such person is a menace to others, a complaint may be lodged against such person by such health officer or board of health with the probate court for the district in which such town, city or borough is situated, and on such complaint such person shall be brought before such court. The judge of such court, after due notice and hearing, if satisfied that such complaint is well founded and that the person is a source of danger to others, may commit him to an isolation hospital or other proper place which is provided by the local health officer or by the state department of health, pursuant to section 2375, there to be received and kept for a period of not less than sixty days. At the time of such commitment, such judge shall make such order for payment for the care and maintenance of such person as he deems equitable; but no patient who desires treatment by prayer or spiritual means, in the exercise of religious freedom, shall be subject to isolation or detention as provided for in this section, except that he may be isolated or quarantined in his own home and shall comply with the sanitary code of the state. At the termination of the period of commitment, the medical officer in charge of such hospital or other place provided for the care of such person shall submit a detailed report to the local health officer or board of health signing the original application, setting forth the condition of the patient and the communicability of the disease, together with such recommendations as he deems advisable for the

further care and supervision of such person. Any person committed to any place or institution under the provisions of this section shall have the right to appeal to any court having jurisdiction for review of the evidence for which commitment was made."

The above law has been used by the local health officers in dealing with this problem. Difficulties have arisen, however, in setting up accommodations in institutions where such patients might be committed. In most instances, the local isolation hospital has been used for commitment purposes. Tuberculosis sanatoriums, not having the facilities, do not desire to take this type of patient as the disturbance he might cause tends to prompt others, who are willing to stay in the institution for their own benefit, to leave.

In addition to the legal measures, efforts are being made, through the use of federal and state funds for establishing as many programs as possible on a local level so that a continuous check may be kept of the population.

FLORIDA

We have been informed by C. M. Sharp, M.D., Director, Bureau of Tuberculosis Control, Florida State Board of Health, that the state law enacted in 1939 gives broad powers to the State Board of Health which are applicable to tuberculosis: "The State Board of Health shall have power to make, adopt, promulgate, enforce, and from time to time, amend, and repeal, rules and regulations covering sanitation and quarantine as may be necessary for the protection of public health. The regulation so established shall be called and known as the Sanitary Code of the State of Florida. The Sanitary Code may deal with any matters affecting the security of life or health or the preservation and improvement of public health in the State of Florida."

Under the regulations of the State Board of Health, tuberculosis is defined as a communicable disease requiring compulsory reporting, and is subject to quarantine as long as specific organism is discharged.

Compulsory hospitalization may be carried out according to Regulation 25 of the Sanitary Code, which states: "When in the opinion of the health officer proper isolation or quarantine of an affected person, persons, carrier, or contact is not or cannot be effectively maintained on the premises occupied by such person or persons by methods designated by this code, he may remove or require the removal of such person or persons to a hospital or other proper place designated by him; or he may employ such guards or officers as may be necessary to maintain effective isolation or quarantine."

IDAHO

In a communication received in March 1947, L. J. Lull, M.D., Director, Local Health Service, Department of Public Health, reports that the first State Tuberculosis Hospital will be opened in Idaho in the near future. It will be located at Gooding, Idaho.

Up to the present time, tuberculosis patients have been hospitalized in two private hospitals in the State under a plan in which the State Health Department and the County of residence of the patient each contribute half the support of such patient. In the past, facilities and budget have been very limited. It is anticipated that with the inauguration of the new program, adequate care can be given to all patients with

tuberculosis. According to standing arrangements, tuberculous patients will be accepted for treatment at the State Tuberculosis Sanatorium regardless of the place of residence in the State.

IOWA

Information received from Walter L. Bierring, M.D., Collaborating Epidemiologist and Health Commissioner of Iowa, shows that a new law for the isolation of tuberculous patients was instituted in 1946 as a part of the Rules and Regulations of the Iowa State Department of Health.

Isolation can be applied to patients who refuse sanatorium treatment by placarding their homes. The same rule applies to the patient who returns from a sanatorium before treatment has been completed; also to the open case of pulmonary tuberculosis (one with positive sputum) when the patient does not conform with the restrictions of the State Department of Health or local Board of Health in matters relating to the protection of others against the disease. The regulation applies only to patients who are a distinct menace to the public through failure to cooperate in the observance of health precautions.

MARYLAND

The present status of the tuberculosis control program is well portrayed in the communication of C. H. Halliday, M.D., Chief and Epidemiologist, Bureau of Communicable Diseases, State Department of Health. No new legislation has been enacted by the State during 1945 and 1946. However, an ordinance was passed by the Baltimore City Council in June 1945, which authorized the Commissioner of Health of Baltimore City to adopt regulations necessary to govern the medical care or quarantine and isolation of persons having certain specified diseases, tuberculosis included, which are in a communicable stage. Interestingly, no attempt has been made as yet to utilize the powers granted in this ordinance as far as tuberculosis is concerned.

There are no plans for asking for legislation which would make possible the compulsory quarantine and isolation in sanatoriums of persons with communicable forms of tuberculosis. It is felt that legislation of this type would do little, at least at this time, to solve the tuberculosis problem. According to Halliday, it is preferable to secure voluntary hospitalization through the use of the educational means which are available.

In Maryland, a continued decline in the tuberculosis death rate has been recorded during 1945 and 1946. The preliminary estimate of tuberculosis death rate per 100,000 population for 1946 is 57.2 to a rate of 64.5 for 1944. The State Health Department expanded its case finding program through the purchase of five 70 mm. photofluorographic units and by increasing the number of chest clinics held in the counties. The ratio of new cases reported as compared with deaths has remained fairly constant. It has averaged slightly more than three cases per annual death.

Three of the photofluorographic units have been placed in the following general hospitals: the Johns Hopkins Hospital, the University Hospital and the Baltimore City Hospital, where they are used to take routine chest photofluorograms of both in-patient and out-patient admissions. The remaining two photofluorographic units are being used, one for general surveys in the counties of Maryland, and one for similar surveys in Baltimore City.

There is an urgent need for an increase in the available hospital beds for tuberculous patients and also, for suitable means for relieving the financial difficulties of the families of the tuberculous. Bills are before the Maryland Legislature which would expand the present institutional facilities and authorize the transfer of the control of the four state operated sanatoriums to the State Board of Health. The sanatoriums at the present time are operated by an independent Sanatorium Commission.

MISSISSIPPI

A brief resume of the tuberculosis situation has been sent to us by C. C. Smith, M.D., Supervisor, Tuberculosis Control Unit, State Board of Health. There have been no state laws for tuberculosis enacted during 1945 or 1946 and no laws are contemplated at this time. Little is being done concerning quarantine enforcement and institutional isolation. The handicaps are in this respect a lack of beds for forcible isolation and the lack of funds to enforce quarantine. Appropriations are available for the construction of a 200 bed institution for colored tuberculous patients. The case finding program has been intensified during the past two years. There are two mobile photofluorographic units in operation, with plans for three more within the next two years. All of the 65 full time county health departments of Mississippi have diagnostic x-ray equipment in the health center.

MISSOURI

We have received a detailed report from Herbert S. Miller, M.D., Director, Tuberculosis Service of Missouri. As a summary of this and of a review of the Missouri Children's Code and the Missouri Public Health Manual, we can offer the following information.

The major legislative change during 1945 and 1946 involved the creation of a Department of Public Health and Welfare. Under the new law defining the functions of the Division of Health, the latter assumes the responsibility for the administration of the State Tuberculosis Sanatorium through its Section of Local Health and Hospital Administration. It is emphasized that effective anti-tuberculosis activity is intimately associated with effective local health work. There are adequate rules and regulations in effect but the local officials (prosecuting attorneys and the local constabulary) tend to be timid in taking action under such rules and regulations. No thought is being given to enforced institutional isolation on account of the limited institutional facilities. The requests for sanatorium beds exceed that which are available. A great deal of emphasis is laid on the importance of the education of the public in public health matters, with particular reference to the communicability of tuberculosis. The State Health Department makes every effort in promoting the acceptance of sanatorium treatment by the patient voluntarily rather than through enforcement of the law. "We have not been willing to take any action which will permit the sanatorium to be identified with anything other than the idea of a chest hospital. The identification of the sanatorium with ideas of police functions will defeat the purpose of our present educational efforts."

Photofluorographic surveys are to be instituted in the near future and plans are formulated for further expansion of tuberculosis institutions, diagnostic and pneumothorax clinics, rehabilitation and follow-up services.

MONTANA

Arthur E. Rickli, M.D., Director of Tuberculosis Control, State Board of Health of Montana, has informed us that two pieces of legislation were passed in Montana in 1947. The first bill aims at making hospital facilities available for Montana Indians having tuberculosis. The second was part of the bill for post-war planning, in which \$400,000 were made available to the State Sanatorium for the creation of more beds. In 1945, legislation was passed which established the Division of Tuberculosis Control in the State Board of Health.

NEBRASKA

Through the cooperation of E. A. Rogers, M.D., Director, Tuberculosis Survey, Montana Department of Health, we have obtained an up-to-date report on the tuberculosis situation in Nebraska. There have been no laws enacted relative to tuberculosis during 1945 and 1946. Nebraska has no statutes for enforced institutionalization, isolation or quarantine of the tuberculous. No such laws are contemplated for the immediate future. The Tuberculosis Control Division operates one photofluorographic unit, making surveys of the general population, one county at a time. During the two years it has been in operation, most of the state institutions, war plants and colleges have been surveyed also. There is a central tuberculosis registry. Public health nurses carry on follow-up of the known cases, contacts and suspects discovered on surveys. Also extensive educational activities are carried out by the Tuberculosis Control Division in association with voluntary health agencies and the Division of Public Health Education of the State Health Department. Attempts are being made to encourage taking routine chest roentgenograms in general hospitals. The State is assisting in the purchase of equipment in some cases. Rehabilitation of the tuberculous patient is handled by the State Department of Vocational Rehabilitation.

NEW HAMPSHIRE

According to the information received from George F. Campana, M.D., Acting Director, Communicable Disease Control, there was no change made in the state laws concerning tuberculosis during the years 1945 and 1946. State laws covering general communicable diseases have been interpreted so that it is possible to impose quarantine or to require enforced institutional isolation of the tuberculous. However, it is very seldom that such actions are deemed necessary and practicable. Education and persuasion normally prove sufficiently effective to eliminate situations that are a distinct menace to public health. State laws will not permit any mandatory procedures, except where the general public health is clearly endangered. Routine chest x-raying is practically nonexistent in New Hampshire. Mass surveys are carried out by the State intermittently, without a consistent program.

Current plans include the following: (1) A central register of all cases to be maintained in the State Health Department. This will permit a more adequate interchange of information between interested agencies and will prevent lapse of follow-up on cases. (2) Routine chest x-ray examinations for case finding purposes. (3) Employment of a medical social work consultant so as to improve service to families of tuberculous persons, to patients and to former patients.

NEW YORK

William Siegal, M.D., Director, Tuberculosis Case Finding, Department of Health, reports the adoption of a law on April 24, 1946 which makes available facilities for diagnosis, care and treatment of tuberculosis without cost. Voluntary payments are accepted, but no state, county or other public official is permitted to request or require such payments or make any inquiry or investigation for the purpose of determining the ability of such person or of his legally responsible relatives to pay therefor.

At the present time there are 44 public tuberculosis hospitals in the State of New York, with a capacity of 9,471 beds. Of these hospitals, 13 with a capacity of 4,431 are operated by the city of New York, where there is a recognized need for additional facilities.

In the Governor's message of March 4, 1946 it is stated that: "We propose, therefore, that you designate an Inter-Departmental Health Council composed of the Commissioners of the State Department of Health, Social Welfare, Mental Hygiene and Education who, with the assistance of the Chairman of the Health Preparedness Commission, should assist in formulating and through the various departments placing in operation the methods necessary to carry out a comprehensive health program."

This concept deserves due consideration by those whose responsibility it is to conduct an effective anti-tuberculosis campaign through public health agencies.

VIRGINIA

We have been informed by L. J. Roper, M.D., State Health Commissioner of Virginia, that a new Act was added to the Code of Virginia on March 26, 1946, which pertains to tuberculosis control, as follows:

"What acts of tubercular persons to constitute a misdemeanor; penalty. Any person who has tuberculosis in the communicable form who, after having been instructed in writing by the local board of health or health officer or superintendent of any sanatorium of the State to take precautions, which are set forth in such writing to protect the members of his household and the public from being infected by tuberculosis communicated by such person, wilfully refuses to follow such instructions shall, upon proof that same are proper and necessary in the interest of the public health, be guilty of a misdemeanor and upon conviction thereof may be confined in such place as the court may designate, for a term not exceeding six months; in addition, any such person may be required upon his release to post a bond with the court in the amount of not exceeding one hundred dollars conditioned upon his proper performance of such precautions."

Relative to the progress in the tuberculosis control program, plans are in the formative stage for case-finding and the necessary follow-up, which includes isolation of open cases and treatment of all cases in close cooperation with private practitioners.

WISCONSIN

Through the courtesy of Allan Filek, M.D., Director, Division of Tuberculosis, State Board of Health, we have received a copy of the amended laws relating to the admission of tuberculous patients to specialized institutions. The cardinal feature of the new law is free sanatorium

treatment of all tuberculous patients, regardless of their financial means. We are quoting part of this law which became valid on May 4, 1945: "If any such patient shall be the beneficiary of a policy of hospitalization, health or accident insurance or other contract covering care in a tuberculosis sanatorium, he shall be liable to pay the cost of his care to the extent of the liability on such policy, insurance or contract as determined by the admitting court, except that such liability shall not include amounts payable as disability benefits under any such policy. Any such patient who, by reason of his tuberculosis, is entitled to damages or workmen's compensation, shall be liable for the cost of his care to the extent that the same may be recoverable in an action or workmen's compensation proceedings, and may be required to execute all necessary papers and do all necessary acts to insure the collection thereof. Nothing contained in this subsection shall prohibit any patient from paying all or a part of the cost of his care if he so desires."

Andrew L. Banyai, M.D., *Chairman.*

Report of the Committee on Certification

Dr. J. Winthrop Peabody reported progress in the efforts of the Committee on Certification to obtain an American Board of Diseases of the Chest. The Board of Regents authorized the Committee to continue its efforts toward obtaining this board at the earliest possible date.

Report of the Board of Examiners

The Board of Examiners reported that 72 candidates for Fellowship in the College had taken their oral examination that morning and were now taking their written examination. This is the largest class to appear for Fellowship examinations in the College.

Report of the Council on Pan American Affairs

Dr. Chevalier L. Jackson, Chairman of the Council on Pan American Affairs announced that a large delegation of physicians from the Latin American countries were attending the meeting and that an International Dinner had been arranged for that evening at the Ambassador Hotel. Dr. Jackson also announced that a breakfast meeting of the members of the Council on Pan American Affairs would be held on Sunday morning, June 8th.

Report on the Council on European Affairs

The Council on European Affairs has continued to carry out its established threefold policy during the past year: (1) Building up new contacts with qualified specialists in diseases of the chest for the mutual advancement of scientific interests. (2) Serving as an exchange post of information pertaining to this specialty and to health problems, in general. (3) Functioning as a news bureau for the purpose of gathering data which deal with the health situation in Europe and with subjects of related interest. The results of these efforts are being presented at this time in the form of a summary so as to offer a purview of events which have a direct or indirect bearing on the progressive endeavors of the College.

The general European health situation presents a rather gloomy picture. Periodic reports of the press and the observations of individual

INTERNATIONAL NIGHT DINNER, ANNUAL MEETING, AMERICAN COLLEGE OF CHEST PHYSICIANS
 AMBASSADOR HOTEL, ATLANTIC CITY, NEW JERSEY, JUNE 5, 1947



Seated at speakers table, left to right: Drs. Reyes, Martinez, Acosta Velarde, and Colon, Puerto Rico; Drs. Macchiavello and Espinoza Galarza, Peru; Drs. Aguilar, Chattas and Albertal, Argentina; Dr. Alarcon, Mexico; Dr. Jackson, Philadelphia; Dr. Warren, Chairman, San Francisco; Dr. Maurer, Switzerland; Dr. Banyai, Milwaukee; Dr. Pan, China; Dr. Canizares, Philippine Islands; Dr. Mugrditchian, Lebanon; Dr. Carrizo, Panama; Dr. Herradora, Jersey City; Drs. Aldereguia and Mendoza, Cuba; Drs. Alvarado and Alonso, Mexico; Dr. Fauzner, Palestine; and Dr. Sankara Iyer, India.

medical men attest uniformly to this fact. As an illustration, it may be of interest to refer to some of the available commentary. According to the findings of Dr. Ernest L. Stebbins of Johns Hopkins University, who made a survey of health conditions in Europe in 1946, the situation is desperate. A great many of the health institutions, including sanatoriums, are largely destroyed. As a consequence of this and of the starvation and other ravages of the war, in Poland and Greece the tuberculosis death rate has increased by 400 per cent as compared with pre-war levels. In Poland, 17 per cent of the medical students have active tuberculosis. As a welcome measure of rehabilitation, the UNRRA has completely equipped 28 hospitals representing a bed capacity of 26,000.

Your Council is following with alert attention the transactions of the United Nations at Lake Success. It has been with interest to note several items.

The French representative proposed the establishment of international research laboratories for the prevention and cure of disease. It is a reasonable assumption that due share of the available funds and facilities will be assigned to the tuberculosis problem. It behooves the College to offer its moral support to this project and closely to follow further developments in this regard. We believe that it is an opportune time for the Board of Regents to delegate a special committee for maintaining an effective liaison with the Interim Commission of the World Health Organization and later on, with its permanent successor. The Interim Commission of the World Health Organization is headed by Dr. Andrija Stampar of Yugoslavia. It meets every four months. Most likely, the permanent headquarters of this organization will be in Geneva, Switzerland. Its constitution was signed by 61 nations and its work is financed by the United Nations. A budget of \$1,000,000 was adopted for 1947. It will direct the functions of intergovernmental health agencies and takes over the sphere of activities of the League of Nations Health Organization and of L' Office International de Hygiene Publique. It will assume the epidemiological intelligence functions of the health divisions of the UNRRA and integrate the Pan-American Sanitary Bureau as a regional office.

As to the spirit and general concept of this undertaking, it is well to refer to the thoughts expressed by Dr. Parran, the Surgeon General of the United States Public Health Service: "The nations represented here today are signing a Magna Carta for health which will bring into being a world health organization unique in its scope, authority and functions. Its broad purpose is the attainment by all peoples of the highest possible level of health and well being. We are convinced that health is not merely the absence of disease or infirmity but a state of complete physical, mental and social well being—the enjoyment of which we declare to be a fundamental right of every human being without distinction of race, religion, political belief or economic or social condition. We believe its attainment is essential for peace and security."

"While the responsibility for health within its own borders is of primary concern to each nation, the success of each can be greatly enhanced through international teamwork. The world health center we are creating, therefore, should be the directing and coordinating agency to provide information, leadership and assistance in every phase of health work. Not only will the organization aid in disseminating and applying all the scientific knowledge we now possess to prevent disease and pro-

mote health, but it will encourage and conduct scientific research to forge more effective tools. Better remedies will be discovered. New preventives will be found."

"To help reach these goals not only do we need to apply all the knowledge we now have for prevention, treatment and control of diseases everywhere in the world but we need to conduct intensive research in the laboratory, at the bedside and in the field to push back the frontiers of the unknown in health sciences."

In harmony with such ideals, the suggestion was made to initiate an international exchange of scientific information and workers and to arrange periodic research conferences. Moreover, very much along the aims of the College, the creation of world-wide scientific societies was advocated in accordance with the original plans of the International Institute of Intellectual Cooperation formerly under the League of Nations. It is with permissible pride and satisfaction to point to the fact that the American College of Chest Physicians since its inception has been sponsoring such a project. As a matter of fact, the tireless endeavors of various Councils under its jurisdiction as well as of your officers have brought about concrete proof of success in this regard. When you see, as today, at your annual convention, Fellows of the College from Australia, the Philippine Islands, China, from a number of South American countries, Mexico, Cuba, Canada, Switzerland, Yugoslavia and from other distant lands, we cannot but say that our efforts have not been in vain.

A resolution of no less significance introduced at Lake Success, as far as our work is concerned, was that which covers the establishment of a world statistical congress.

Since the last annual convention of the College, thirteen applications for membership have been accepted from Belgium. Thus, in addition to the already well-functioning Greek Chapter, with four Fellows and eleven Associate Members, we have firmly established strongholds in the medical domain of Europe, represented by Fellows in Norway, Portugal, Italy, Switzerland and Yugoslavia.

According to information received in Belgium, 32 sanatoriums for the treatment of tuberculosis are affiliated with or owned by a private organization, the Belgian National Organization for Defense Against Tuberculosis. In addition, it collaborates with 130 dispensaries staffed by 225 physicians and 254 visiting nurses.

Reports are becoming available from The Netherlands relative to the tremendous increase in the incidence of tuberculosis in adults due to malnutrition and lack of facilities for the isolation of communicable forms of tuberculosis during the war. There is a noteworthy point in the recorded statistical observations: whereas before the war the incidence of bovine tuberculosis in children was 9.6 per cent, during the war years it was only 1.8 per cent. This can be readily explained by the unavailability of milk for consumption due to depletion of the herds by the invading enemy.

As a regrettable, nay, tragic consequence of the war, the death rate from tuberculosis is approximately three times greater in France than in the United States. Since June 1946, a nation-wide anti-tuberculosis campaign has been in effect in France. Through central directives as to general principles, various districts of the country organize their efforts through, (1) "aeriums," centers for exposed children and those

exposed to tuberculosis; (2) preventoriums for patients with recent primary tuberculosis who are sputum negative, or who have erythema nodosum of tuberculous origin, or serofibrinous tuberculous pleurisy with effusion; (3) sanatoriums for the treatment of active cases of tuberculosis; (4) institutions for after-care and rehabilitation. Every patient with active tuberculosis is sent immediately to a sanatorium, without waiting for decision regarding questions of who will be financially responsible for the cost. According to a new law, the tuberculous patient is entitled to one-half of his salary if single and to two-thirds if he has dependents. During the period of his rehabilitation, all his incidental medical expenses are paid, together with complementary benefits, according to his earning capacity. Even when completely rehabilitated, medical expenses connected with the patient's former disease are covered from public funds. Some of these provisions which aim at the prevention of economic pauperization of the patient and his family may serve as useful models for future planning in most of our States.

In Turkey, the number of sanatorium beds and dispensaries are far below current needs. In all, there are only 1,500 beds available for the tuberculous. The tuberculosis mortality rate in large cities is 150-200 per 100,000 and in rural communities, 80-100. The Society for the Prevention of Tuberculosis of Istanbul is carrying on heroic attempts for establishing more sanatoriums and dispensaries.

It is with genuine pleasure to inform you that recently, Professor Lopo de Carvalho of Lisboa, Portugal, has been admitted as a Fellow to the College. His outstanding research work and numerous contributions to the medical literature in the form of scientific papers and books are well known. He is President of the International Union Against Tuberculosis. His attendance and participation in the transactions of this annual meeting have been planned for some time. Unfortunately, circumstances beyond control prevented the materialization of this thought. We are confident that it will be possible to have him on our scientific program next year.

We are proud to announce the steady increase in our membership in Switzerland.

As a reflection on the aforementioned matters, we believe that the Fellowship of the College should take active interest in the reorganization of the International Union Against Tuberculosis which is in progress at the present time. No scientific session of the Union has been held since 1937. It seems desirable that the College should be well represented in its scientific activities.

Recently, a new scientific organization has been formed under the name of American-Swiss Foundation, with headquarters at Montclair, New Jersey. Its chief aim is to arrange exchange lecture tours for scientists of the two countries.

A noteworthy development in our progress with European contacts is a subscription to the "Diseases of the Chest" by the Karolinska Institute of Stockholm, Sweden, since March 1946.

Also, we wish to call your attention to newly established exchange relations between the College journal on the one hand, and the *Archiva Medica Belgica*, the publication of the Association of Medical Scientific Societies of Belgium, and *Medicine et Hygiene* of Geneva, Switzerland, on the other hand.

Statistical reports of the UNRRA and of the Interim Commission of the United Nations Health Organization are currently kept in the files of this Council and are available through the Executive Office of the College.

Through more intimate contact with qualified specialists of Europe interested in chest diseases, we anticipate gaining access to hitherto unavailable scientific data. No efforts will be spared in gathering information for the perusal of College members concerning such items as various tuberculosis control systems, number and types of tuberculosis institutions, diagnostic and therapeutic methods applied in diseases of the chest, nutritional surveys, matters pertaining to medical education and various aspects of experimental and clinical research work pertaining to the specialty of chest diseases.

We feel that with the moral support of the Fellowship of the College and particularly, with the cooperation of its European members, we shall accomplish the task assigned to this Council.

Andrew L. Banyai, M.D., *Chairman.*

Report of the Council on Pan Pacific Affairs

Dr. Harry C. Warren, Chairman of the Council on Pan Pacific Affairs reported a steady increase in College membership in the Middle and Far Eastern countries and that a number of members from those countries were present at this meeting. Dr. Miguel Canizares, Governor of the College for the Philippine Islands, and Dr. Lincoln Pan, delegate from China, have been invited to address the assembly at the International Dinner to be given tonight. Representatives from a number of other countries have also been invited to participate in the program.

The meeting was adjourned at 4:30 p. m.

Second Session, Board of Regents

The Board of Regents convened for its second session on Sunday, June 8. Dr. Placak, Chairman of the Board, called the meeting to order at 5:00 p. m. Dr. Gustave Maurer, Davos, Switzerland, and Dr. Edward A. Greco, Portland, Maine, were introduced as new members to the Board of Regents.

Dr. Paul A. Turner, Louisville, Kentucky, was elected as a member of the Executive Council to represent the Board of Regents.

Dr. Carl H. Gellenthien, Valmora, New Mexico, was elected by the Board as a member of the Nominating Committee.

The following resolutions were introduced and adopted:

RESOLUTION

WHEREAS, The College membership has grown since the present By-Laws were adopted in 1942, and

WHEREAS, The activities of the College have been greatly expanded, THEREFORE,

BE IT RESOLVED, That the President of the College be authorized to appoint a committee of three or more members to review the present By-Laws and submit recommendations to the Board of Regents of the College for any necessary revision.

RESOLUTION

WHEREAS, It is the intent and purpose of the College to continually raise the standards of Fellowship in the College, and

WHEREAS, One of the important steps taken by the Board of Regents of the College to bring this about has been the establishment of a Board of Examiners, and

WHEREAS, There are numerous requests received at the Executive Offices of the College for a waiver of examinations for applicants applying for Fellowship in the College, and in order that proper machinery may be established for the handling of such requests,

THEREFORE, BE IT RESOLVED, That all applicants for Fellowship in the College shall be required to appear before the Board of Examiners for oral and written examinations, and

BE IT FURTHER RESOLVED, That such instances where a request for a waiver of examination has been received, such a request should first be submitted to the Governor of the College in the state wherein the applicant resides, and upon favorable recommendation of the Governor, the request should be sent to the Regent of the College in the district wherein the applicant resides, and should the request be favorably received by the Regent, he in turn shall submit such a request in writing to the Chairman of the Board of Regents for final approval. The Chairman of the Board of Regents shall then notify the Executive Secretary of the College of the decision of the Board of Regents and the applicant shall be so notified by the Executive Secretary.

RESOLUTION

WHEREAS, The name of the Maryland-District of Columbia Chapter of the College does not include its membership in West Virginia, and

WHEREAS, The name "Maryland-District of Columbia Chapter" is a cumbersome one,

THEREFORE, BE IT RESOLVED, That the name of the Maryland-District of Columbia Chapter be changed to the "Potomac Chapter" of the American College of Chest Physicians.

RESOLUTION

WHEREAS, The officials and members of the New Jersey Chapter of the College gave unstintingly of their time to complete the arrangements for the Annual Meeting of the College in Atlantic City, and

WHEREAS, As a result of their efforts the College had the most successful meeting in its history, and

WHEREAS, The New Jersey and Pennsylvania Chapters of the College did their full share to entertain the visiting members and their families at a most successful cocktail party,

THEREFORE, BE IT RESOLVED, That the Board of Regents of the College give official recognition to these fine accomplishments and extend their thanks and appreciation to the members of the College in the New Jersey and Pennsylvania Chapters, and in particular to Dr. Irving Willner, Chairman of the General Arrangements Committee for the meeting, and to Dr. Paul K. Bornstein and Dr. Charles Hyman, who so ably assisted the Chairman in

completing the arrangements for the meeting. It is directed that the Executive Secretary send a copy of this resolution to the officials of the New Jersey and Pennsylvania Chapters of the College, as well as to the physicians whose names are mentioned in this resolution.

Other council and committee reports presented at the annual meeting will be published in future issues of the journal.

Annual Meeting, Board of Governors

The Board of Governors of the American College of Chest Physicians held its annual meeting at the Ambassador Hotel, Atlantic City, New Jersey, on June 5, 1947.

The following Governors and Alternates registered for the meeting:

Robert K. Campbell, M.D., Springfield, Illinois, Chairman	
Alabama	Kellie N. Joseph, M.D., Birmingham
Arizona	Howell Randolph, M.D., Phoenix
Arkansas	David H. Shipp, M.D., Little Rock (alternate)
California	Seymour M. Farber, M.D., San Francisco (alternate)
Colorado	W. Bernard Yegge, M.D., Denver (alternate)
Connecticut	Cole B. Gibson, M.D., Meriden
Delaware	Gerald Beatty, M.D., Wilmington
Dist. of Columbia	W. LeRoy Dunn, M.D., Washington (alternate)
Florida	M. Jay Flipse, M.D., Miami
Georgia	Carl C. Aven, M.D., Atlanta
Idaho	Kenneth A. Taylor, M.D., Gooding (alternate)
Indiana	Robert A. Staff, M.D., Rockville
Kansas	Charles F. Taylor, M.D., Norton (alternate)
Kentucky	T. Ashby Woodson, M.D., Louisville
Maine	Edward A. Greco, M.D., Portland
Maryland	Otto C. Brantigan, M.D., Baltimore
Massachusetts	Hubert A. Boyle, M.D., New Bedford
Michigan	Willard B. Howes, M.D., Detroit
Minnesota	Karl H. Pfuetze, M.D., Cannon Falls
Mississippi	Robert E. Schwartz, M.D., Hattiesburg
Missouri	W. W. Buckingham, M.D., Kansas City
New Jersey	Martin H. Collier, M.D., Grenloch
New York	George Foster Herben, M.D., Yonkers
North Carolina	Merle D. Bonner, M.D., Jamestown
Ohio	D. W. Heusinkveld, M.D., Cincinnati
Oklahoma	Robert M. Shepard, M.D., Tulsa
Pennsylvania	Ross K. Childerhose, M.D., Harrisburg (alternate)
Rhode Island	U. E. Zambarano, M.D., Wallum Lake
South Carolina	R. Kyle Brown, M.D., Greenville
Tennessee	David H. Waterman, M.D., Knoxville
Texas	Elliott Mendenhall, M.D., Dallas (alternate)
Utah	William R. Rumel, M.D., Salt Lake City (alternate)
Virginia	Dean B. Cole, M.D., Richmond (alternate)
West Virginia	George R. Maxwell, M.D., Morgantown
Wisconsin	Andrew L. Banyai, M.D., Milwaukee
Wyoming	Carleton O. Anton, M.D., Sheridan

U. S. Government Services:

U. S. Army	Major General S. U. Marietta, Washington, D. C.
U. S. Navy	Comdr. Sidney A. Britten, Washington, D. C.
U. S. Public Health Service	Herman E. Hilleboe, M.D., Washington, D. C.
U. S. Veterans Administration	Roy A. Wolford, M.D., Washington, D. C.

Other Countries:

Canada	A. F. Miller, M.D., Quebec
Philippine Islands	Miguel Canizares, M.D., Manila

Dr. Campbell called the meeting to order and commented briefly on the fine response of all the Governors in replying promptly to correspondence concerning the objectives and accomplishments of the College. Comments in all instances were fully appreciative of the objectives and showed real pleasure in the progress we have made and the many things we have accomplished.

Suggestion of subjects for consideration at the annual meeting centered mainly around further work toward the eventual establishment of a Board on Diseases of the Chest and that more attention be given in our regular programs to non-tuberculous chest conditions. Also, that all hospitals throughout the country be encouraged in every way to make a chest x-ray of all patients admitted.

Our President, Dr. Hendricks, spoke to the Governors present regarding the progress that had already been made toward eventual establishment of a specialty board. Dr. Hendricks spoke also on the desirability of the American Medical Association establishing a Section on Diseases of the Chest in the Scientific Assembly and the Board of Governors voted their unanimous approval of such a Section.

Dr. Hendricks gave details of progress that had been made by the research council in diseases of the chest which was established by resolution at the annual meeting of the Board of Regents one year previous. Definite progress has been made but further work and continued support will, of course, be necessary.

A resolution was passed that a committee be appointed to study the revision of the College By-Laws.

The method of handling requests for waiver of Fellowship examinations was discussed in some detail and it was felt that this waiver seldom should be used but may be applied in exceptional cases.

Dr. Campbell was re-elected Chairman of the Board of Governors and Dr. Hubert A. Boyle was elected by the Board of Governors to the Nominating Committee.

Meeting adjourned.

College Councils and Committees

COUNCIL ON UNDERGRADUATE MEDICAL EDUCATION

	<i>Term Expires</i>
Edward W. Hayes, M.D., Monrovia, California, Chairman	1950
Andrew L. Banyai, M.D., Milwaukee, Wisconsin, Secretary	1949
William S. Conklin, M.D., Portland, Oregon	1950
Louis L. Friedman, M.D., Birmingham, Alabama	1949
C. Howard Marcy, M.D., Pittsburgh, Pennsylvania	1948

Elliott Mendenhall, M.D., Dallas, Texas	1949
Nelson W. Strohm, M.D., Buffalo, New York	1948
David Ulmer, M.D., New York, New York	1948
George A. Welchons, M.D., Richmond, Virginia	1950

Editorial Committee

BOOK*: "The Fundamentals of Pulmonary Tuberculosis and Its Complications" (For the Student, the Teacher and the Practicing Physician)

Edward W. Hayes, M.D., Monrovia, California, Chairman
 Andrew L. Banyai, M.D., Milwaukee, Wisconsin
 Herman E. Hilleboe, M.D., Albany, New York
 Jay Arthur Myers, M.D., Minneapolis, Minnesota
 J. Winthrop Peabody, M.D., Washington, D. C.

Editorial Committee

BOOK*: "Non-Tuberculous Diseases of the Chest"

Andrew L. Banyai, M.D., Milwaukee, Wisconsin, Chairman
 Seymour M. Farber, M.D., San Francisco, California
 Alvis E. Greer, M.D., Houston, Texas
 Edward W. Hayes, M.D., Monrovia, California
 Charles M. Hendricks, M.D., El Paso, Texas
 Minas Joannides, M.D., Chicago, Illinois
 Jay Arthur Myers, M.D., Minneapolis, Minnesota
 George G. Ornstein, M.D., New York, New York
 J. Winthrop Peabody, M.D., Washington, D. C.

*These books are being published by Charles C. Thomas, Springfield, Illinois.

COUNCIL ON POSTGRADUATE MEDICAL EDUCATION

	<i>Term Expires</i>
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Frank R. Ferlaine, M.D., New York, New York, Secretary	1949
Seymour M. Farber, M.D., San Francisco, California	1949
Alvis E. Greer, M.D., Houston, Texas	1948
Chevalier L. Jackson, M.D., Philadelphia, Pennsylvania	1948
Edwin R. Levine, M.D., Chicago, Illinois	1950
I. L. Robbins, M.D., New Orleans, Louisiana	1950
Lawrence M. Serra, M.D., Baltimore, Maryland	1950
W. Bernard Yegge, M.D., Denver, Colorado	1948

COUNCIL ON PUBLIC HEALTH

	<i>Term Expires</i>
Paul A. Turner, M.D., Louisville, Kentucky, Chairman	1949
Francis J. Weber, M.D., Washington, D. C., Secretary	1950
Sidney A. Britten, Comdr., U.S.N., Washington, D. C.	1948
John B. Grow, M.D., Denver, Colorado	1948
W. H. Hatfield, M.D., Vancouver, B. C., Canada	1949
Herman E. Hilleboe, M.D., Albany, New York	1950
Robert G. McCorkle, M.D., San Antonio, Texas	1950
Walter E. Vest, M.D., Huntington, West Virginia	1949
Roy A. Wolford, M.D., Washington, D. C.	1948

*Committee on Chest Diseases in Penal and Mental Institutions**

Otto L. Bettag, M.D., Pontiac, Illinois, Chairman
 B. B. Bagby, Jr., M.D., Martinsburg, West Virginia
 G. C. Bellinger, M.D., Salem, Oregon
 H. A. Burns, M.D., St. Paul, Minnesota
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 A. A. Leonidoff, M.D., Poughkeepsie, New York

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 Frank R. Ferlaino, M.D., New York, New York
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 R. L. Laney, M.D., Joplin, Missouri
 Nelson W. Strohm, M.D., Buffalo, New York
 William F. Wagner, M.D., San Francisco, California
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*The Committees on Chest Diseases in Penal and Mental Institutions and Occupational Diseases of the Chest serve under the Council on Public Health.

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	<i>Term Expires</i>
James H. Stygall, M.D., Indianapolis, Indiana, Chairman	1949
Irving Willner, M.D., Newark, New Jersey, Secretary	1950
Maurice Campagna, M.D., New Orleans, Louisiana	1948
Cole B. Gibson, M.D., Meriden, Connecticut	1948
Harry Golembe, M.D., Liberty, New York	1950
D. W. Heusinkveld, M.D., Cincinnati, Ohio	1948
J. Karl Poppe, M.D., Portland, Oregon	1950
Rufus A. Schneiders, M.D., San Diego, California	1949
Darrell H. Trumpe, M.D., Springfield, Illinois	1949

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OF TUBERCULOSIS HOSPITALS AND SANATORIA

	<i>Term Expires</i>
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E. F. Conlogue, M.D., Dayton, Ohio	1949
M. A. Cunningham, M.D., Beaumont, Texas	1948
David F. Loewen, M.D., Decatur, Illinois	1949
Arthur F. Miller, M.D., Kentville, Nova Scotia, Canada	1950
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*The Committees on Sanatorium Standards and Rehabilitation serve under the Council of Medical Directors and Superintendents of Tuberculosis Hospitals and Sanatoria.

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John Roberts Phillips, M.D., Houston, Texas, Secretary
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William F. Rienhoff, Jr., M.D., Baltimore, Maryland
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B. L. Freedlander, M.D., San Francisco, Calif., Vice-Chairman
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Manuel Albertal, M.D., Buenos Aires, Argentina
Arnold Shamaskin, M.D., Hines, Illinois
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John V. Thompson, M.D., Indianapolis, Indiana

*The Committees on Surgical Treatment of Diseases of the Chest, Non-Surgical Collapse Therapy, and Chemotherapy and Antibiotics serve under the Committee on Management and Treatment of Diseases of the Chest.

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J. Winthrop Peabody, M.D., Washington, D. C.

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Donato G. Alarcon, M.D., Mexico City, Mexico
Jose Antezana Estrada, M.D., La Paz, Bolivia
Carlos Arboleda Diaz, M.D., Bogota, Colombia
Jose Ignacio Baldo, M.D., Caracas, Venezuela
Juan Max Boettner, M.D., Asuncion, Paraguay
J. A. Couillard, M.D., Quebec, Canada
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Affonso MacDowell, M.D., Rio de Janeiro, Brazil
Amadeo V. Mastellari, M.D., Panama City, Republic of Panama
Antonio Navarrete, M.D., Havana, Cuba
H. Orrego Puelma, M.D., Santiago, Chile
Arthur Q. Penta, M.D., Schenectady, New York
Octavio Rivero, M.D., Havana, Cuba
Jose Rodriguez Pastor, M.D., Santurce, Puerto Rico
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Edgar Mayer, M.D., New York, New York
Lincoln Pan, M.D., Shaoshing, China
Li Shu Fan, M.D., Hong Kong, China

SEMI-ANNUAL MEETING, BOARD OF REGENTS

The Semi-Annual Meeting of the Board of Regents of the College will be held at the Statler Hotel, Washington, D. C., on Saturday, Nov. 22.

ANNOUNCEMENT

The Board of Examiners plans to conduct the next oral and written examinations for Fellowship in the American College of Chest Physicians at Washington, D. C., November 21, 1947. The oral examinations will be conducted in the morning and the written examinations will be held in the afternoon. Only physicians whose applications for Fellowship have been approved by the Board of Regents will be eligible for this examination. If you desire to take the examination, please write to the Executive Secretary, 500 North Dearborn Street, Chicago 10, Illinois.

College Chapter News

POTOMAC CHAPTER

The Fourth Bi-Annual Meeting of the Potomac Chapter of the College will be held in the District of Columbia Medical Society Building at 1718 "M" Street N. W., Washington, D. C., on Sunday, October 5, 1947, at 1:00 p. m.

1:00 p.m. Registration.

2:00 p.m. Scientific program as follows:

"Recent Trends in the Surgical Therapy of Pulmonary Tuberculosis," Herbert C. Maier, M.D., New York, New York.

"Etiology of Hemoptysis Associated with a Negative Plain Chest X-ray," Osler A. Abbott, M.D., F.C.C.P., Atlanta, Ga.

"The Role of Inhalation Therapy in the Management of Bronchiectasis," Arthur M. Olsen, M.D., Rochester, Minn.

"Postmortem Pneumothorax,"
David Salkin, M.D., F.C.C.P., Hopemont, West Virginia.

"The Cytology of Bronchial Secretions in Carcinoma of the Lung," Peter A. Herbut, M.D., Philadelphia, Pennsylvania.

5:15 p.m. Short business meeting, following the scientific program at D. C. Medical Society Building.

6:00 p.m. Cocktail Party, Mayflower Hotel.

6:30 p.m. Dinner, Mayflower Hotel.

8:00 p.m. X-Ray Conference at which interesting x-ray films will be presented, Mayflower Hotel.

SOUTHERN CHAPTER

The Fifth Annual Meeting of the Southern Chapter, American College of Chest Physicians, will be held at the Sheraton Belvedere Hotel, Baltimore, Maryland, on Sunday, November 23, and Monday, November 24. The Southern Medical Association will meet in Baltimore on November 24-27, 1947.

The program for the meeting of the Southern Chapter of the College will be as follows:

Sunday, November 23, Sheraton Belvedere Hotel:

1:00 p. m. Registration.

2:00 p. m. Scientific Session.

"An Evaluation of Planigrams in Pulmonary Tuberculosis,"
Walter L. Nalls, M.D., F.C.C.P., and
Philip Morgenstern, M.D., F.C.C.P., Oteen, North Carolina.

*"The Technique of Rapid Culture of Tubercle Bacilli,"
Rene DuBos, Ph.D., New York, New York.

"The Clinical Application of Topographical Anatomy of the
Bronchi and Lungs,"
Chevalier L. Jackson, M.D., F.C.C.P., Philadelphia, Pa.

"Modern Methods in the Diagnosis and Treatment of
Mediastinal Masses,"
Osler Abbott, M.D., F.C.C.P., Atlanta, Georgia.

Monday, November 24, Sheraton Belvedere Hotel:

8:30 a. m. Registration.

9:00 a. m. Scientific Session.

"The Diagnosis of Bronchogenic Carcinoma by Sputum
Examination,"
Thomas H. Burford, M.D., St. Louis, Missouri.

"Bronchography Made Easy,"
Duane Carr, M.D., F.C.C.P., Memphis, Tennessee.

"Streptomycin Protection in the Surgical Treatment of
Tuberculosis,"
Brian B. Blades, M.D., F.C.C.P., Washington, D. C.

*"Tuberculosis and Pregnancy,"
Hollis E. Johnson, M.D., F.C.C.P., Nashville, Tennessee.

12:30 p. m. Luncheon Meeting.

Panel Discussion: "Lung Abscess."

Louis A. M. Krause, M.D., Baltimore — *Medicine*,
Otto C. Brantigan, M.D., F.C.C.P., Baltimore — *Surgery*,
Donald Proctor, M.D., Baltimore — *Endoscopy*.

Business Meeting.

Election of Officers.

2:00 p. m. Scientific Session.

Papers on chest diseases to be delivered before the Southern
Medical Association.

6:00 p. m. Cocktail Party.

7:00 Annual Banquet.

President's Address,
Paul A. Turner, M.D., F.C.C.P., Louisville, Kentucky,
President, Southern Chapter, American College of Chest
Physicians.

Guest Speaker,
Alfred Blalock, M.D., Baltimore, Maryland,
"The Surgical Treatment of Coarctation of the Aorta."

8:45 p. m. X-Ray Conference.

Charles P. Cake, M.D., F.C.C.P., Washington, D. C.,
Moderator.

Note: All scientific papers will be open for discussion from the floor, discussions to be limited to five minutes each. Those wishing to show films at the X-Ray Conference need not notify the moderator before the meeting. Wide participation is invited.

*Acceptance and Exact Title not Confirmed.

Program Committee:

David H. Waterman, M.D., Knoxville, Tennessee, Chairman
Dean B. Cole, M.D., Richmond, Virginia
Herbert L. Mantz, M.D., Kansas City, Missouri

Arrangements Committee:

O. C. Brantigan, M.D., Baltimore, Maryland, Chairman
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W. F. Rlenhoff, Jr., M.D., Baltimore, Maryland
Lawrence M. Serra, M.D., Baltimore, Maryland

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Ladies Entertainment Committee:

Mrs. William Rlenhoff, Jr., Baltimore, Maryland, Chairman
Mrs. Lawrence Serra, Baltimore, Maryland
Mrs. Otto C. Brantigan, Baltimore, Maryland

ILLINOIS CHAPTER

There will be a joint meeting of the Illinois Chapters of the American Trudeau Society and the American College of Chest Physicians held at the Abraham Lincoln Hotel, Springfield, Illinois, on October 2. The following program will be presented:

2:00 p. m. Arthur S. Webb, M.D., F.C.C.P., Glen Ellyn, Illinois, presiding.

"The Need for Periodic X-ray Examination of Adult Chests,"
Charles K. Petter, M.D., F.C.C.P., Waukegan, Illinois.

Discussion opened by:

Clifton Hall, M.D., F.C.C.P., Springfield, Illinois.

"The Role of Bronchoscopy in Diseases of the Chest,"
D. H. Trumpe, M.D., F.C.C.P., Springfield, Illinois.

Discussion opened by:

Stuart Broadwell, M.D., Springfield, Illinois.

"Our Experience with Streptomycin and Summary of Present Status" (Including Movie if completed by that date),
George H. Vernon, M.D., F.C.C.P., Springfield, Illinois.

Discussion opened by:

A. E. Steer, M.D., F.C.C.P., Springfield, Illinois.

"Limitations of Collapse Procedures,"

J. A. Stocker, M.D., F.C.C.P., Springfield, Illinois.

Discussion opened by:

Loren L. Collins, M.D., Edwardsville, Illinois.

Sangamon County Medical Society Regular Meeting:

6:00 p. m. Social period.

6:30 p. m. Dinner.

8:00 p. m. Guest Speaker,

"Tuberculosis in General Practice and the Specialties,"

Jay Arthur Myers, M.D., F.C.C.P., University of Minnesota
Medical School, Minneapolis, Minnesota.

PENNSYLVANIA CHAPTER

The Pennsylvania Chapter of the College will hold a business meeting and election of officers during the meeting of the Pennsylvania State Medical Society Meeting which begins on September 15 at Pittsburgh.

VENEZUELAN CHAPTER MEETING (ORGANIZED)

Caracas, Venezuela, May 20, 1947



Sitting (left to right): Drs. Iturbe, Delgado, Gimenez, Overholt, Baldo, Criollo. Standing (left to right): Drs. Rodriguez, Pardo, Ortega, Montoya, Toro, Jaso, Principe, Estrada, Soules, Polack, Gonzalez, Fernandez. Standing in back (left to right): Drs. Valladares, Benshimol and Lozano.

MICHIGAN CHAPTER

The Michigan Chapter of the College will hold a dinner meeting on Tuesday evening, September 23, during the 82nd Annual Session of the Michigan State Medical Society, at Grand Rapids. A program will follow. Officers of the Michigan Chapter are: President, Arthur R. Young, M.D., Pontiac; Vice-President, William P. Chester, M.D., Detroit; and Secretary-Treasurer, C. J. Golinvaux, M.D., Monroe.

NORTH MIDWEST CHAPTER

At the annual meeting of the North Midwest Chapter of the College, which was held at the Holland Hotel, Duluth, Minnesota, July 1, the following officers were elected for 1947-1948:

Sumner Cohen, M.D., Oak Terrace, Minnesota, President,
John Allen, M.D., Omaha, Nebraska, Vice-President,
Karl H. Pfuetze, M.D., Cannon Falls, Minnesota, Secretary-Treasurer.

At the business meeting the matter of working toward the establishment of an affiliate board of diseases of the chest was discussed at some length. It was the consensus of the group that such a board would undoubtedly serve to improve the standards of diagnosis and treatment of chest diseases among the profession. The chapter went on record as favoring the establishment of more adequate residencies in medical schools and teaching hospitals for the training of men who wish to specialize in chest diseases.

The importance of streptomycin as an aid in the treatment of tuberculosis was discussed. The chapter felt that streptomycin has already established itself as a valuable adjunct in the treatment of certain types of tuberculosis, and that state, county and city sanatoria should make the drug available to those patients which experience to date has shown may be benefited by its use. A committee was appointed, consisting of Drs. Sumner Cohen, G. A. Hedberg, and Karl H. Pfuetze, to draft a statement to the effect that streptomycin is already established as a valuable weapon in the armamentarium against tuberculosis of certain types, and that sanatorium boards should make allowance for its purchase in future budgets. This statement is to be sent to sanatorium superintendents in the North Midwest Chapter area for presentation to their various boards in the hope that the sanatorium boards will be favorably influenced by the action of this chapter in recommending use of the drug in indicated cases.

ROCKY MOUNTAIN CHAPTER

The Rocky Mountain Chapter of the College held its annual meeting at the Hotel Shirley-Savoy, Denver, Colorado, September 16. The Colorado State Medical Society also met in Denver, September 17-20.

The following program was presented at the chapter meeting:

A. M. Mullett, M.D., F.C.C.P., Colorado Springs, Colorado,
President, Rocky Mountain Chapter, Presiding.

"Present Status of Aluminum Therapy in Silicosis,"
John Berry, M.D., Denver, Colorado

"The Future of Institutional Treatment of Pulmonary Tuberculosis,"
P. J. Sparer, M.D., F.C.C.P., Denver, Colorado

"Immobilization Therapy in Pulmonary Tuberculosis,"
Alvan L. Barach, M.D., F.C.C.P., New York, New York

"Psychosomatic Problems in Pulmonary Tuberculosis,"
Charles M. Hendricks, M.D., F.C.C.P., El Paso, Texas

"Symposium on Streptomycin in Pulmonary Tuberculosis,"
Lt. Col. J. B. Wallace, Fitzsimons General Hospital
Capt. J. S. Greer, Fitzsimons General Hospital
Lt. M. W. Fisher, Fitzsimons General Hospital
Daniel W. Zahm, M.D., Fort Logan Hospital
S. A. Adland, M.D., J.C.R.S. Sanatorium
H. M. Van Der Schouw, M.D., Lutheran Sanatorium
Ralph C. Dwork, M.D., National Jewish Hospital

"Differential Diagnosis of Chest Tumors,"
Fred R. Harper, M.D., Denver, Colorado

"Surgical Treatment of the Round Focus of Pulmonary Tuberculosis,"
John B. Grow, M.D., F.C.C.P., Denver, Colorado

"Resume of Histoplasmosis,"
Charles F. Taylor, M.D., F.C.C.P., Norton, Kansas

"Present Status of B.C.G.,"
P. J. Sparer, M.D., F.C.C.P., Denver, Colorado

There was also a luncheon meeting of the chapter at which the guest speaker, Dr. Alvan L. Barach, spoke on "Antibiotic Therapy in Pulmonary Tuberculosis."

VIRGINIA CHAPTER

The following officers were elected at the Second Annual Meeting of the Virginia Chapter of the College, which was held at the Pine Camp Hospital, Richmond, on June 23rd:

Dean B. Cole, M.D., Richmond, President
C. L. Harrell, M.D., Norfolk, Vice-President
Charles W. Scott, M.D., Burkeville, Secretary-Treasurer.

WISCONSIN CHAPTER

The Third Annual Meeting of the Wisconsin Chapter of the College will be held at the Schroeder Hotel, Milwaukee, on October 5. A scientific program will be presented, starting at 2:00 p. m. The program is as follows:

Paul E. Pifer, M.D., F.C.C.P., Kenosha, Chairman.
Douglas Guthell, M.D., Milwaukee, Vice-Chairman.

"Cardinal Manifestations of Interstitial Pneumonitis,"
W. A. Douglas Anderson, M.D., Milwaukee
Discussants: John W. Connell, M.D., Fon du Lac
Emil Rothstein, M.D., F.C.C.P., Wood

"Differential Diagnosis and Treatment of Cystic Malformations of the Lung," W. E. Adams, M.D., Chicago, Illinois

Discussant: George H. Jurgens, M.D., F.C.C.P., Milwaukee

"Pulmonary Adenomatosis,"

Frederick J. Pohle, M.D., Madison

Discussant: Stanley R. Szymanski, M.D., Wood

"Diagnosis and Treatment of Laryngotracheobronchitis,"

George H. Logan, M.D., Rochester, Minnesota

Discussant: Karl E. Kassowitz, M.D., Milwaukee

"Surgical Aspects of Heart Disease,"

Chester M. Kurtz, M.D., Madison

Discussant: Mischa J. Lustock, M.D., F.C.C.P., Milwaukee

"Recent Advances in the Treatment of Bronchial Asthma,"

Samuel J. Taub, M.D., Chicago, Illinois

Discussant: Richard P. Jahn, M.D., Milwaukee

There will be a dinner meeting at 6:00 p. m. at which Dr. Carl O. Schaefer, Racine, Governor of the College for Wisconsin, will preside.

At 8:00 p. m. an x-ray conference will be presented at which William T. Clark, M.D., Janesville, Wisconsin, will preside. X-ray films of unusual interest will be shown at this conference.

POSTGRADUATE COURSE IN DISEASES OF THE CHEST

More than 100 inquiries were received regarding the Second Annual Postgraduate Course in Diseases of the Chest to be held at the Municipal Tuberculosis Sanitarium, Chicago, September 15-20. Due to the large number of physicians who expressed a desire to take this postgraduate course, the committee in charge of arrangements decided to increase the enrollment from 30 to 55, which is the maximum seating capacity of the assembly hall.

The Council on Postgraduate Medical Education regrets that all of the applicants could not be accepted and it is hoped that these physicians will register for some of the other postgraduate courses to be given by the Council in the near future.

The physicians who took the course came from 19 states, the District of Columbia, Canada and Mexico. The following instructors participated in this Second Annual Postgraduate Course in Diseases of the Chest:

ANDREW L. BANYAI

Associate Clinical Professor of Medicine, Marquette University.

ALVAN L. BARACH

Associate Professor of Clinical Medicine, Columbia University.

ALVIS E. GREER

Clinical Professor of Medicine, Baylor University.

JOHN B. GROW

Thoracic Surgeon, National Jewish Hospital.

PAUL H. HOLINGER

Assistant Professor of Laryngology, Rhinology and Otology, University of Illinois College of Medicine.

MINAS JOANNIDES

Assistant Professor of Surgery, University of Illinois College of Medicine.

LOUIS KATZ

Director, Cardiovascular Department, Michael Reese Hospital.

EDWIN R. LEVINE

Director of Chest Service, Michael Reese Hospital.

MILTON I. LEVINE

Associate Professor in Pediatrics, Cornell University Medical College.

JAY ARTHUR MYER

Professor of Medicine and Public Health, Medical and Graduate Schools, University of Minnesota.

ARTHUR W. NEWITT

Tuberculosis Control Officer, Municipal Tuberculosis Sanitarium.

GEORGE G. ORNSTEIN

Associate Professor of Medicine, New York Medical College.

J. WINTHROP PEARBODY

Professor of Diseases of the Respiratory System, Georgetown University School of Medicine.

WILLIAM F. PETERSEN

Director, Department of Clinical Research, St. Luke's Hospital.

KARL H. PFUETZE

Medical Director, Mineral Springs Sanatorium.

WILLIS J. POTTS

Professor of Surgery (Rush), University of Illinois College of Medicine.

LEO G. RIGLER

Professor and Chief of the Department of Radiology and Physical Therapy, Medical and Graduate Schools, University of Minnesota.

SOL ROY ROSENTHAL

Director, Tice Laboratory for BCG Vaccination, Chicago Municipal Tuberculosis Sanitarium and the University of Illinois.

OSCAR A. SANDER

Studies in Occupational Disease and Industrial Case Findings.

JOHN P. SPIEGEL

Chief, Psychiatric Clinic, Michael Reese Hospital.

HENRY C. SWEANY

Medical Director of Research, Municipal Tuberculosis Sanitarium.

J. ROBERT THOMPSON

Assistant Medical Director of Research, Municipal Tuberculosis Sanitarium.

GEORGE C. TURNER

Staff Physician, Municipal Tuberculosis Sanitarium.

WILLIAM M. TUTTLE

Thoracic Surgeon, Herman Kiefer Hospital.

LEON UNGER

Associate Professor of Medicine, Northwestern University Medical School.

ITALO F. VOLINI

Professor and Chairman, Department of Medicine, Loyola University School of Medicine.

GUY P. YOUNG

Associate Professor of Bacteriology, Northwestern University Medical School.

The Council appreciates the cooperation given by the Board of Directors and the staff of the Municipal Tuberculosis Sanitarium in the presentation of this course. The Council also commends Dr. Edwin R.

Levine, a member of the Council on Postgraduate Medical Education and Chairman of the Medical Education Committee of the Illinois Chapter, for arranging the course. Dr. Levine was ably assisted in arrangements for the course by the other members of his committee, Dr. Paul H. Holinger, Dr. Minas Joannides and Dr. Arthur S. Webb, ex officio.

College News Notes

Nelson W. Strohm, M.D., F.C.C.P., Buffalo, New York, Regent of the College for New York State has been appointed full time director of Tuberculosis Control in the Buffalo Department of Health.

Arthur S. Kimball, M.D., F.C.C.P., formerly Medical Director, Oakland County Tuberculosis Sanatorium, Pontiac, Michigan; has been appointed Medical Director, Arthur S. Kimball Sanatorium, Battle Creek, Michigan. He succeeds W. Leonard Howard, M.D., who resigned to become Medical Director, Maybury Sanatorium, Northville, Michigan. The Arthur S. Kimball Sanatorium, Battle Creek, Michigan, was named in honor of Dr. Kimball's father.

Bernard Klein, M.D., F.C.C.P., Joliet, Illinois, was awarded 3rd Prize by the Physicians' Literary Guild for his essay entitled: "Veiled Horizon." The Guild meets annually with the American Medical Association and physicians who are interested in their activities should communicate with Dr. F. H. Redewill, 526 Flood Building, San Francisco, Calif., Secretary, American Physicians' Literary Guild.

Benjamin L. Brock, M.D., F.C.C.P., formerly Medical Director of the Waverly Hills Sanatorium, Waverly Hills, Kentucky, has resigned from the Veterans Administration and has opened offices in the Brown Building, Louisville, Kentucky, where he will confine his practice to the specialty of diseases of the chest. Dr. Brock is serving as Secretary-Treasurer pro tem of the College and is the Chairman of the Council of Medical Directors and Superintendents of Tuberculosis Hospitals and Sanatoria.

Manuel Quisumbing, M.D., F.C.C.P., City of San Pablo, Philippine Islands, recently made a trip to Europe. While in Spain he made the following addresses before the Academy of Medical Science: "The Campaign Against Tuberculosis in the Philippines," given in Bilbao, and "A Comparative Study of Clinical Forms of Tuberculosis in Children and Adults in Spain and its Types in the Philippines," given in Barcelona.

Herman E. Hilleboe, M.D., F.C.C.P., a Governor of the College, was appointed by Governor Thomas E. Dewey as Commissioner of the New York State Department of Health. The appointment became effective July 1, 1947. Dr. Hilleboe was formerly Assistant Surgeon General, associate chief of the Bureau of State Services of the United States Public Health Service.

The film of Paul H. Holinger, M.D., F.C.C.P., and Ralph G. Rigby, M.D., F.C.C.P., "Kodachrome Cinematography of Bronchial Tumors," won the grand prize for the best scientific film at the World Film and Fine Arts Festival held in Brussels in June of this year.

The Peruvian Tuberculosis Society has elected the following new officers for the year 1947-1948:

President: Ramon Vargas Machuca, M.D., F.C.C.P.

Vice-President: Juan M. Escudero Villar, M.D., F.C.C.P.

Secretaries: Alejandro Lengua Romero, M.D.,

R. Celso Arellano Z., M.D.

Treasurer: Segundo Hunco Vizcardo, M.D.

Librarian: Carlos A. Lopez Ore, M.D.

A paper entitled "Cancer of the Chest Cavity" was presented by Alton Ochsner, M.D., F.C.C.P., New Orleans, Louisiana, at the Kentucky Division of the American Cancer Society which was held in St. Joseph's Infirmary, Louisville, August 21, 22 and 23.

Karl Pfuetze, M.D., F.C.C.P., Cannon Falls, William H. Feldman, M.D., and H. C. Hinshaw, M.D., Rochester, Minnesota, were awarded a certificate of merit for their exhibit at the American Medical Association convention in Atlantic City in June. Their exhibit was entitled "Streptomycin: Experimental and Clinical Observations," and demonstrated the use of streptomycin in the treatment of tuberculosis.

T. R. Owens, M.D., F.C.C.P., Muncie, Indiana, has been elected President of the Delaware-Blackford County Medical Society.

Leo Eloesser, M.D., F.C.C.P., San Francisco, California, has returned to China on behalf of the World Health Organization Interim Commission. Dr. Eloesser was assigned as teaching specialist in surgery for the Chinese Medical Training Program of the UNRRA in 1945. He was formerly Professor of Clinical Surgery at Stanford University School of Medicine, San Francisco.

Paul H. Holinger, M.D., F.C.C.P., Chicago, Illinois, was elected Secretary of the American Broncho-Esophagological Association at their annual meeting in Atlantic City on June 9. The newly-elected President is Millard F. Arbuckle, M.D., St. Louis, Missouri, and Clyde A. Heatly, M.D., Rochester, New York, was elected as Treasurer. The Council members elected are as follows: Drs. Francis W. Davison, Edward J. Whalen, Robert M. Lukens and Carlos E. Pitkin.

John S. Bouslog, M.D., F.C.C.P., Denver, Colorado, has been elected President of the Colorado State Medical Society.

The following officers were recently elected by the Colombian Tuberculosis Society:

President: Carlos Arboleda Diaz, M.D., F.C.C.P.

Vice-President: Jorge Llinas Olarte, M.D.

Secretary: Alfonso Vargas Rubiano, M.D.

Treasurer: Jesús M. Barragan

Directors: Alfonso Gutierrez P., M.D.; Nazario Orozco R., M.D., and Zacarias Ayala, M.D.

Walter L. Nalls, M.D., F.C.C.P., has been appointed clinical director of the Veterans Administration Hospital at Oteen, North Carolina. Dr. Nalls was formerly associated with Dean Cole, M.D., F.C.C.P., of Richmond, Va.

William S. Conklin, M.D., F.C.C.P., and J. K. Poppe, M.D., F.C.C.P., of Portland, Oregon, presented papers at the 73rd Annual Session of the Oregon State Medical Society, held in Portland, September 4-6. The title of Dr. Conklin's paper was "Surgical Treatment of Cardiovascular Anomalies," and Dr. Poppe spoke on "Bronchiectasis."

Daniel W. Wheeler, M.D., F.C.C.P., Duluth, Minnesota, President of the St. Louis County Medical Society, presided at the Annual Banquet of the 94th Annual Session of the Minnesota State Medical Association held at the Hotel Duluth, on July 1st.

Myron D. Miller, M.D., F.C.C.P., Washington, D. C., Tuberculosis Control Division, U. S. Public Health Service, discussed "Recent Developments in Management and Control of Tuberculosis" at the meeting of the Peoria Medical Society on May 20th.

LIFE MEMBERSHIP

We are pleased to announce that the following physicians became Life Members of the American College of Chest Physicians, on the dates listed:

Edward J. Lynch, Shelton, Connecticut, Oct. 8, 1946

Angela M. Piscitelli, San Francisco, California, Oct. 28, 1946

Squire S. Beverly, Rutland Heights, Massachusetts, Nov. 20, 1946

Shelley U. Marietta, Washington, D. C., Dec. 29, 1946

Chester G. Crist, Gettysburg, Pennsylvania, March 13, 1947.

MANUAL ON RECORD SYSTEMS FOR TUBERCULOSIS CONTROL

The U. S. Public Health Service has prepared a manual to assist in the establishment of efficient record systems for tuberculosis control. This manual presents a proved and tried method of keeping such records. Copies may be obtained by writing to the Federal Security Agency, U. S. Public Health Service, Tuberculosis Control Division, Washington, D. C.

MESSAGE FROM THE GOVERNOR OF THE COLLEGE FOR CHINA

To Colleagues of the
American College of Chest Physicians

Gentlemen:

First, may I convey my heartiest greetings from China?

Second, will you accept my sincere apology for being unable to attend this year's meeting of the College?

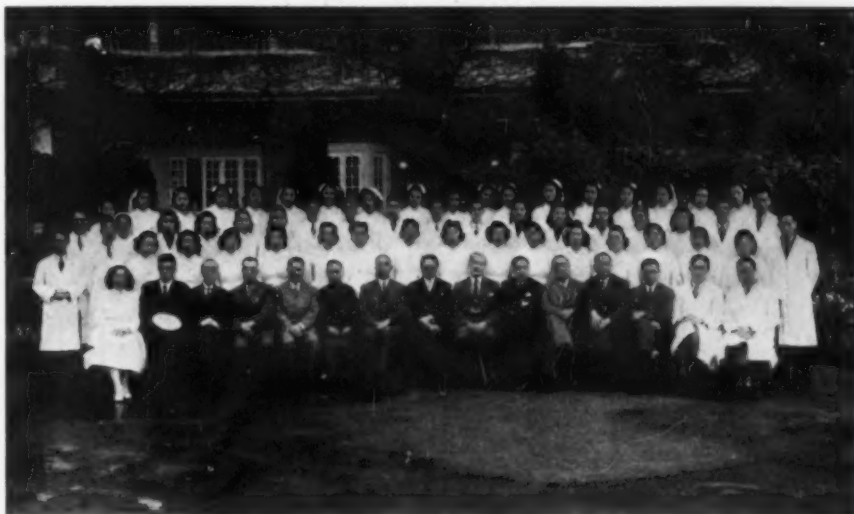
My impressions of the last few meetings of the College which I was privileged to attend, convince me how much I shall be missing spiritually and materially by this unavoidable absence. To me, the meetings were not only the sources of the greatest stimulation, but they were the means through which I had made so many staunch and esteemed friends.

On behalf of my Chinese fellow colleagues of the College, I wish the meeting unqualified success and the College continued progress in its service to humanity.

Yours fraternally,

Dr. Li Shu Fan, Governor,
American College of Chest Physicians.

Staff, Hong Kong Hospital and Sanatorium, Hong Kong, China



The above photograph was taken at the time of a visit of the Governor to the institution. Dr. Li Shu Fan, Governor of the College for China, is Medical Director of the Hong Kong Hospital and Sanatorium.

New Private Sanatorium Opened in Mexico City

The Sanatorio San Angel, Mexico City, was inaugurated on July 14 with suitable ceremonies for this auspicious event. Dignitaries representing important groups in Mexico City attended the inauguration.

The Sanatorio San Angel features the latest and most modern design in sanatorium construction. It is the first private tuberculosis sanatorium built in Mexico City and it will serve as a necessary armamen-

tarium in the control of tuberculosis not only in Mexico but in all of the nearby countries.

Dr. Donato G. Alarcon, the Medical Director of the sanatorium, is well known to all of the members of the College. The Board of Regents of the College, of which Dr. Alarcon is a member, wishes him and his associates success in this new venture.

TUBERCULOSIS SOCIETY OF ECUADOR

The Tuberculosis Society of Ecuador (Sociedad Ecuatoriana de Tisiologia) met in Guayaquil on June 26 and elected the following officers for the year 1947-1948:

President: Jorge A. Higgins, M.D., F.C.C.P.

Vice-President: Jorge Fajardo C., M.D.

Recording Secretary: Jorge Perez A., M.D.

Secretary of Scientific Sessions: Ernesto Briones, M.D., F.C.C.P.

Treasurer: Juan Villacis, M.D.

Librarian: Victor H. Gavilanes, M.D.

Directors: Emillo Jaramillo L., M.D.

Eduardo Rendon, M.D.

Dr. Jorge A. Higgins was elected Governor of the College for Ecuador at the Annual Meeting held in Atlantic City, June 5-8, and Dr. Juan Tanca Marengo was elected Regent of the College for Ecuador.

ARMY MEDICAL LIBRARY MICROFILM SERVICE

During the war, the Army Medical Library, through its Photoduplication Services, supplied millions of pages of microfilmed medical articles to the armed services and other research agencies. The principal of immediate aid direct to the user, wherever he might be, introduced a new technique to assist medical research.

This service is now generally available for civilian physicians, institutions and research workers on a cost basis. This means direct access to the library's enormous resources of medical literature.

A fee of fifty cents is charged for filming any periodical article in a single volume, regardless of length. Microfilming from monographs is furnished at fifty cents for fifty pages or fraction thereof. Photostats are also available at a charge of fifty cents per ten pages or fraction thereof. Material filmed is not for reproduction without permission of the copyright owner.

For convenience and to keep bookkeeping costs down, a coupon system has been established. Users may buy any quantity of photoduplication coupons at fifty cents each. Order blanks are available upon request. Checks should be made payable to the Treasurer of the United States, and sent to the Army Medical Library, 7th Street and Independence Avenue, S. W., Washington 25, D. C.

